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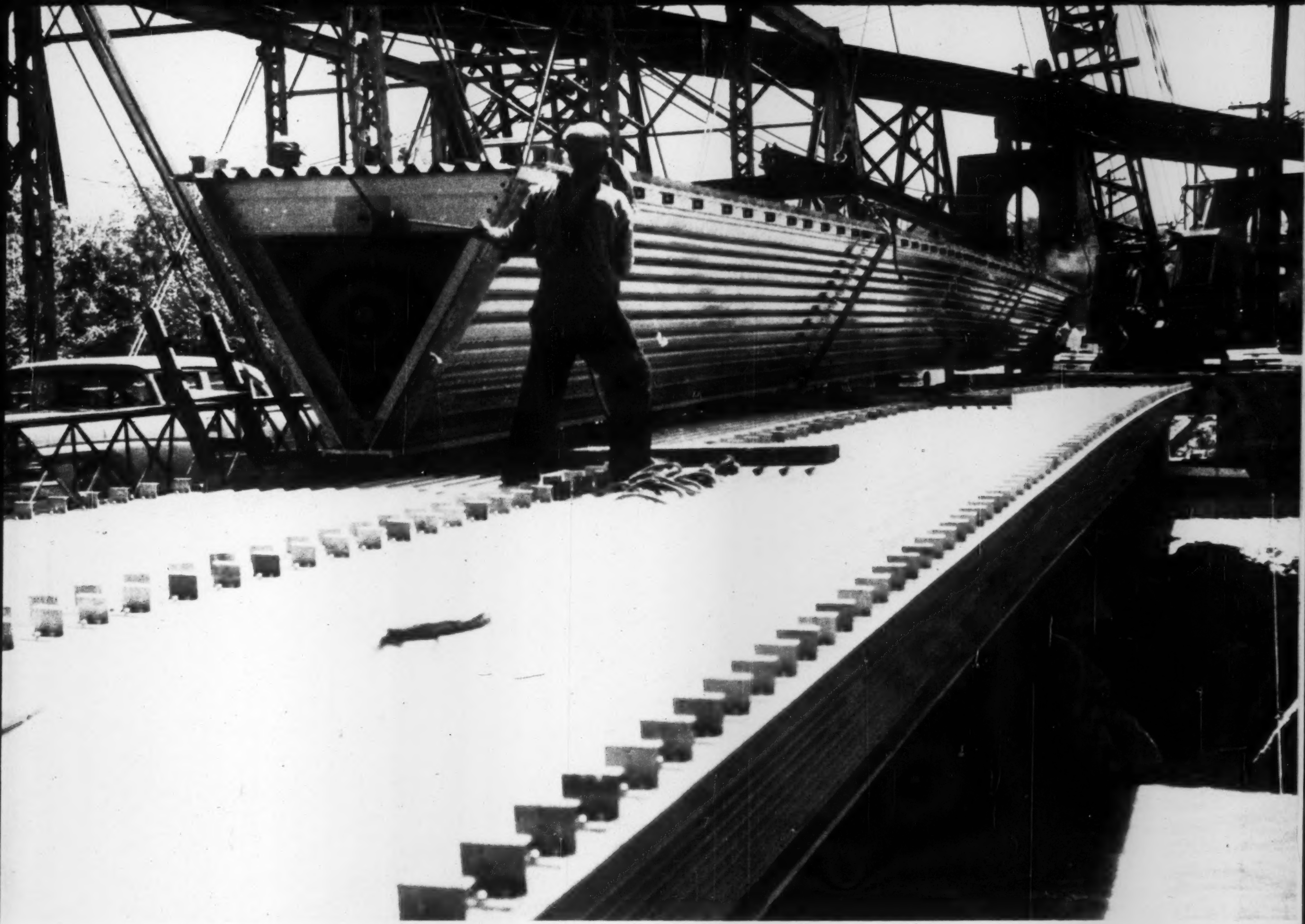

Aircraft aluminum comes down to earth p.30

STEVENS RICE
UNIV MICROFILMS INC
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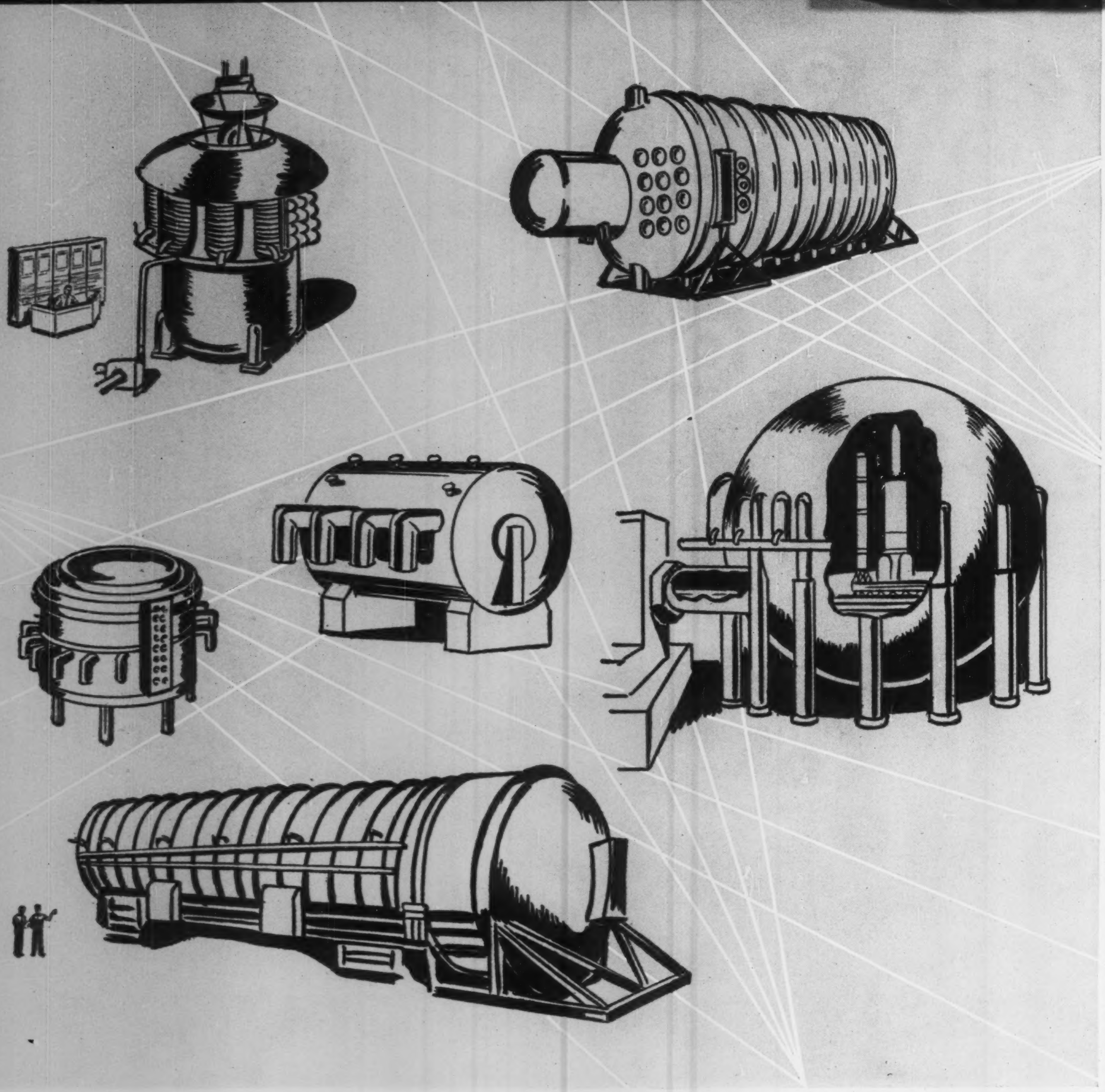

Down-to-Earth Space Chamber Designs

These sketches demonstrate CB&I's ingenuity in designing structures to simulate outer space. Eleven such CB&I field-erected structures are in service or under construction, simulating conditions beyond the stratosphere. CB&I's 70 years of experience in the design, fabrication and construction of steel structures assures capable responsibility from conceptual design of environmental chambers through start up. Write for Bulletin G-53. Chicago Bridge & Iron Company, 332 S. Michigan Ave., Chicago 4, Illinois. Offices and subsidiaries throughout the world.

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Serving leaders in the fields of Aerospace, Nuclear Power, Chemistry, Petroleum, Cryogenics, Hydroelectric Power, and Municipal and Industrial Water Supply.

CB-615

Profitable Production HERE

Feather Construction Co., of Morgantown, West Virginia, power their Cedarapids Commander Plant with a 203 HP (continuous) Murphy Diesel to assure delivering more power into the job.

demands MORE POWER DELIVERED INTO THE JOB with a MURPHY MP DIESEL

Take a look at the amount of aggregate coming off this delivery conveyor. That is profitable production! It goes on like this hour after hour, day after day, because all the power from the engine is put *into* the job . . . usable power that's delivered where it counts for maintaining high daily tonnages.

MP Series Murphy Diesel engines are designed and built to react to load changes immediately, with the high rising torque that delivers More Power *into* the job when needed. Murphy Diesels have the ability to take hold of a load and really hang on, to help keep your plant at the right operating speed under the toughest crushing conditions.

Power that's merely *on* the job can't increase your plant's productivity. It's the *total usable power* delivered *into* the job each day which determines that day's production, and profit. Be sure you are getting maximum output from your plant . . . put Murphy MP Power in your job today. Your Murphy Diesel Dealer has full details about Murphy's new MP Concept of Power.

435-N

MURPHY DIESEL

Here's the MP Series line-up for construction

MP SERIES ENGINES AND POWER UNITS—105 HP to 420 HP, 1200 and 1400 RPM

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Throughout the Nation

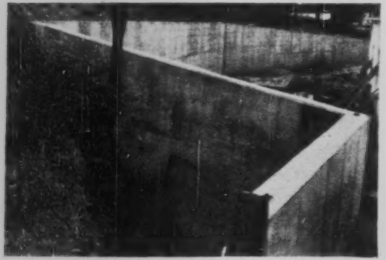
Battered Walls

Symons Steel-Ply Forms Solve Complicated Wall Problem

952 Ties Required . . . 186 Different Sizes

Alvey & Eldridge Construction Company to save time in pouring a battered retaining wall 202 feet long in Kansas City, used Symons Steel-Ply Forms. The contractor rented 2,400 square feet of forms to pour the 4,800 square feet of forming. This amounted to 204 cubic yards of concrete.

The Symons system particularly showed its versatility on this complicated wall with the use of Symons Ties. 952 ties were required. And it was necessary to furnish 186 different sizes.



Completed section of battered wall. Note the clean, smooth finish.

Upon completion of the job which was done for Skelly Oil Company, Roy Eldridge, president of the firm was so well pleased with the performance of the Symons Steel-Ply Forms that he purchased the 2,400 square feet. You too may want to try Symons Steel-Ply Forms on a rental purchase plan. Write for details. One of our sales engineers will be happy to call at your request.

Symons

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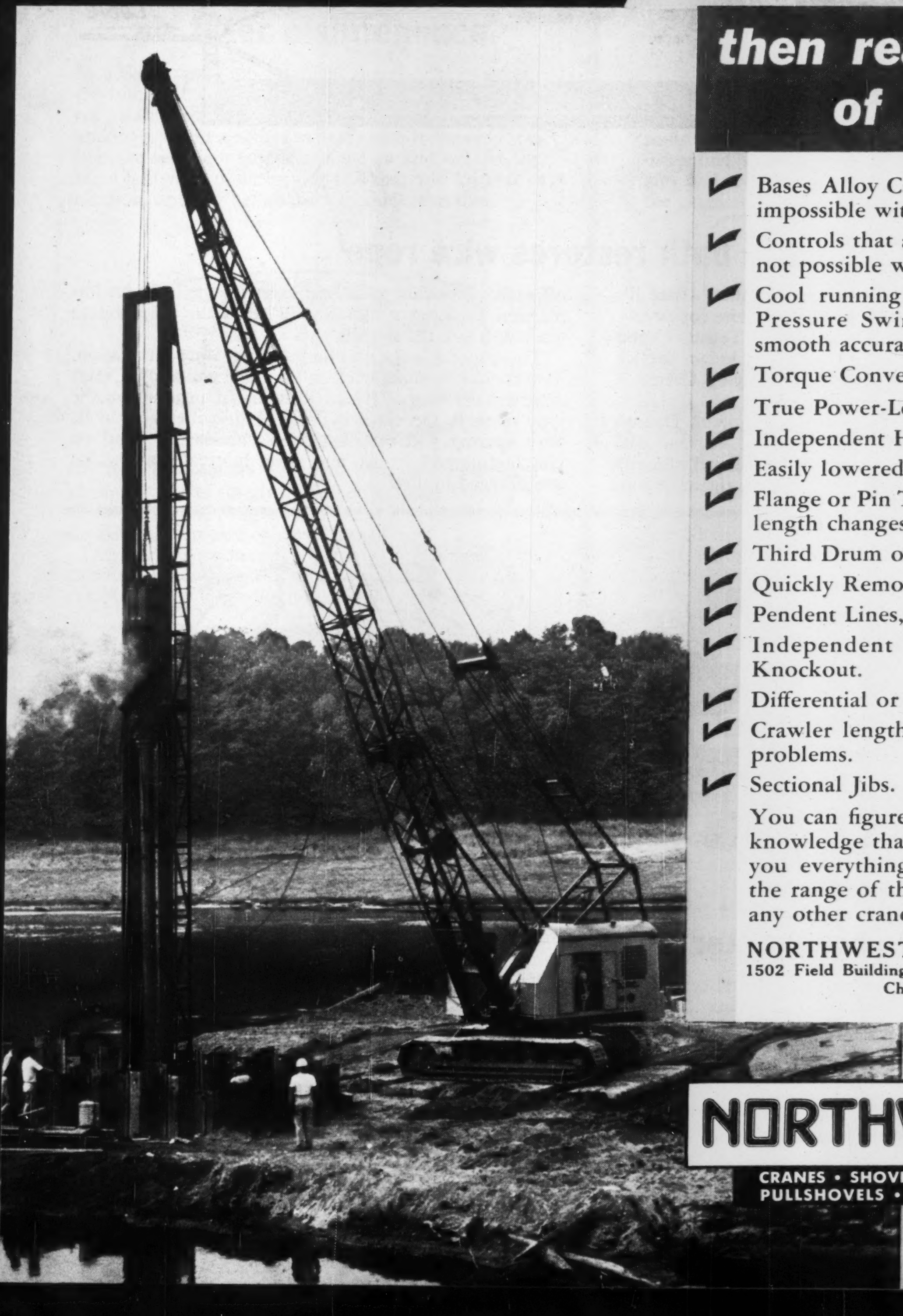
then read the rest of the ad



- ✓ Bases Alloy Cast Steel—of a ruggedness impossible with welded structures.
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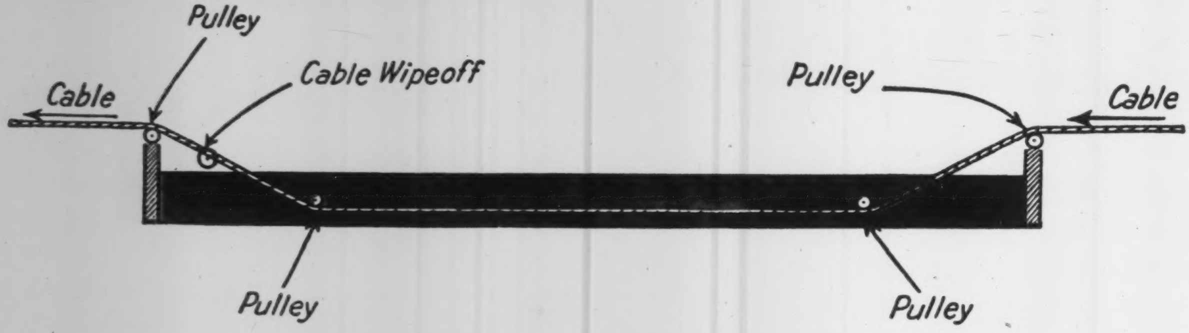
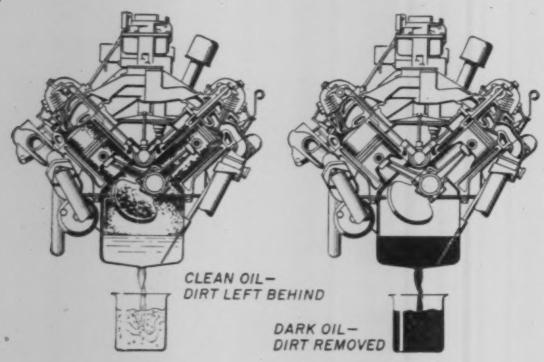


Warm bath restores wire rope

The best way to get lubricant inside a cable, where it's really needed, is to immerse the cable or wire rope every 500 hours or so in a bath of warmed-up Texaco Crater A lubricant. It pays off by giving you far longer service life than you would get simply by applying Crater A externally.

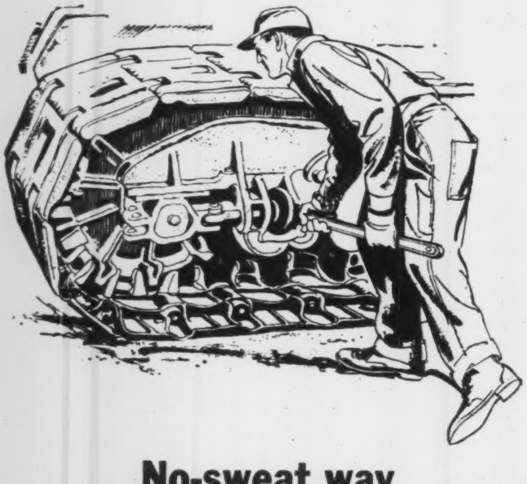
This warm-bath treatment requires a horizontal trough to hold the lubricant. The trough should be fitted with pulleys to keep the cable completely submerged while it's passing through. A burlap collar should be rigged to wipe off excess lubricant as the cable leaves the box. An immersion of about a minute will allow the lubricant to work well into the strands.

This process is *not* an alternative to other lubrication. You should continue to clean the cable and apply Crater A externally every 10 to 100 hours, depending on the type of work the cable is doing. Remember also to be very sparing with lubricants on cables that wind on clutch-equipped drums, and never lubricate cables that are dragged in dirt.


CLEAN OIL—
DIRT LEFT BEHIND
DARK OIL—
DIRT REMOVED

Dark engine oil . . . sign of a hard worker

Here's a motor-oil misconception that's still common enough to need discussion. Some folks think that the better an engine oil is, the more likely it is to come out as clean as it went in. The truth of the matter is just the other way around. A good detergent-dispersant oil holds onto dirt like an old friend. It keeps dust, soot and carbon in suspension, and carries it out of the engine when you drain the oil. Oil that looks clean when you drain it from the crankcase is a sign that these contaminants may still be inside the engine. Moral: oil that darkens in use is really doing its job.



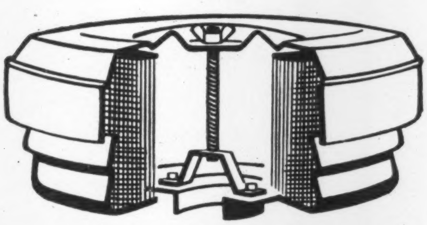
No-sweat way to adjust crawler treads

Crawler treads are easier to adjust if you dab a little Texaco Threadtex on the adjusting screws. The Threadtex stays put through months of service, keeps the screws free-turning and corrosive-proof. Another good use for Threadtex is on track bolts, when you're making up track. A little dab of Threadtex on the bolts will save a lot of time and work in taking down track after it has been in service.

to trim downtime

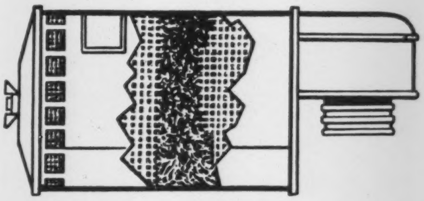
Key points on air filter maintenance

In a day's operation a typical engine inhales several thousand cubic feet of air, and on a construction project all that air is probably loaded with abrasive dirt and dust. Good air-filter maintenance is the only way to make sure your engine gets the air and *not* the dirt. Here are some maintenance tips that will keep your air filter working better through thick and thin.

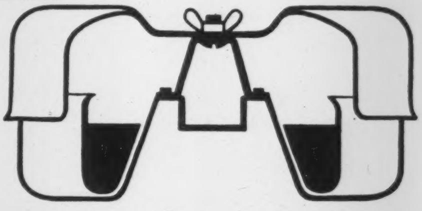


Dry type air cleaners (the ones with the fluted paper element) should simply be shaken or tapped lightly to remove dirt, and reinstalled. Never clean dry-type elements with kerosine or diesel fuel.

Additional precautions: empty centrifugal precleaners when the glass container is half full; don't remove the oil cup when the engine is running.

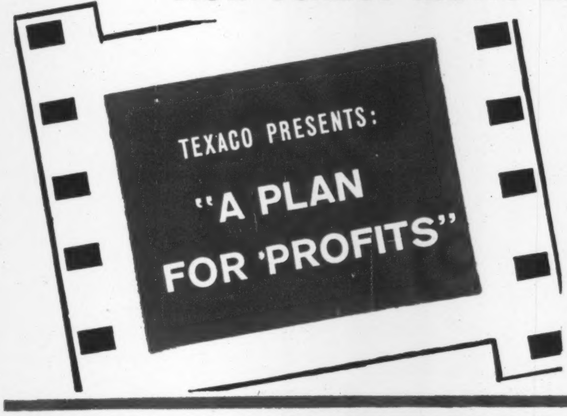


If your filter is the wire gauze type, and you want to re-use the element, wash the gauze in kerosine or diesel fuel, shake it dry *(don't* blow it with compressed air) and re-oil it with SAE 40 or SAE 50 oil to coat the element.



Oil-bath type air filters won't function properly if there's more than a half inch of sediment at the bottom of the oil reservoir. Check the sediment level by sticking a screw-driver down into the oil, and if you're anywhere near the half-inch level the bowl should be cleaned out and refilled. Also, inspect the filter every 5 to 50 hours to make sure the oil itself is at the right level. Every 500 hours the whole cleaner should be dismantled and cleaned, and refilled with new engine oil of the same grade used in the crankcase.

New Texaco movie can help boost your profits



This factual, down-to-earth presentation shows you how 1% of your total budget (the amount usually spent on lubricants) can minimize a major cause of equipment downtime.

SEE: How the biggest engineering job ever undertaken was 90% lubricated with only *four* different products.

SEE: How one contractor lubricated 21 different types of equipment with only seven products.

SEE: "A Plan for Profits"—Texaco's newest sound and color movie.

FOR AN EARLY SHOWING contact your Texaco Contractor Representative *now.*

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Man is your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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TESTS PROVE:

NEW JOINTING MATERIAL LASTS LONGER THAN SUBSTITUTE PIPE

Lifetime Vitrified Clay Pipe—which is chemically inert and can't be damaged by gases and acids normally found in sewer lines—has been the standard of excellence for centuries.

But how about the new resilient jointing materials now being used on Clay Pipe? How do they stand up under acid attack?

Samples of standard jointing material have been suspended in sewer lines in cities all over the country to see how they react to normal exposure. But we wanted to find out quickly if they stand up to sulphuric acid—the number one killer of sanitary sewer lines built of substitute pipe.

In one test, samples of cement-asbestos, concrete and clay pipe and five jointing materials were weighed dry, then exposed to a five-percent sulphuric acid solution for 100 days. They were then removed from the acid, dried, and weighed again to observe weight loss and disintegration.

The results were amazing!

The sample of concrete pipe was completely disintegrated. The sample of cement-asbestos pipe was badly laminated and almost disintegrated.

But there was no evidence of any deterioration of either the jointing materials or, naturally, the Vitrified Clay Pipe.

Get all the facts* before you specify any kind of pipe for your community's sewer line. There's no substitute for lifetime Vitrified Clay Pipe with the new compression joints.

**Further explanation of this experiment is available on request.*

Pipe and jointing materials after 100 days exposure in 5% Sulphuric Acid Solution

before ↑
PIPE MATERIALS
after ↓
Cement-Asbestos
Concrete
Vitrified Clay
6 NEW JOINTING MATERIALS
before ↑
JOINTING MATERIALS
after ↓
before ↑
JOINTING MATERIALS
after ↓

Unretouched photographs made at the NCPMI Research Laboratory

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Ave., Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

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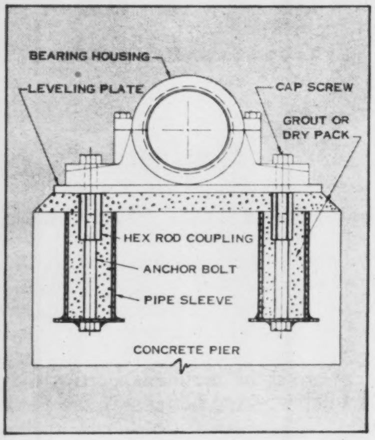
CLAY IMPERVIOUS PIPE
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Avenue Washington 6, D. C.

Reader Comment



Adjustable Anchor Bolts

Sir—In the construction of large water treatment plants, horizontal-shaft mixing equipment is widely used for mixing and flocculation purposes. The shafting at the bearings usually is of solid steel, but the portions between bearings usually are of heavy steel pipe. Heavy shafts up to 6 in. in diameter are difficult to raise when repairing or replacing the bearings. With this in mind, and to facilitate the original installation, I designed the assembly illustrated.

By adjustment of the rod couplers, the leveling plates can be raised to the required elevation and then, after the bearings and shafting have been installed, the rod couplers may be used for final adjustment without the use of shims.

In the event it should become necessary to remove a bearing for repair or replacement, you simply remove the cap screws holding the bearing, lift off the top half of the bearing and then slide out the lower half without raising the shafting.

This design is presently being used in five large water treatment plants located in California. I believe that it might be useful in many industrial applications.

Russell C. Kenmir
President
James M. Montgomery
Consulting Engineers
Pasadena, Calif.

(Reader Comment continued p. 10)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Thanks to ZEECON...

Mr. Norman Shute, President, Shute Concrete Products, Inc., Richmond, Indiana

"This concrete was so strong, so dense, we couldn't fire a bolt into it"

The pre-cast, pre-stressed seating channels (shown above) used in the Indiana University Stadium had to be extremely strong and dense. Specifications permitted only 2 to 4% air entrainment! To meet these requirements, Contractor Norman Shute used Eucon-WR, an additive that reduces water requirements through the action of Crown Zellerbach's Zeecon, a controlled dispersant for concrete.

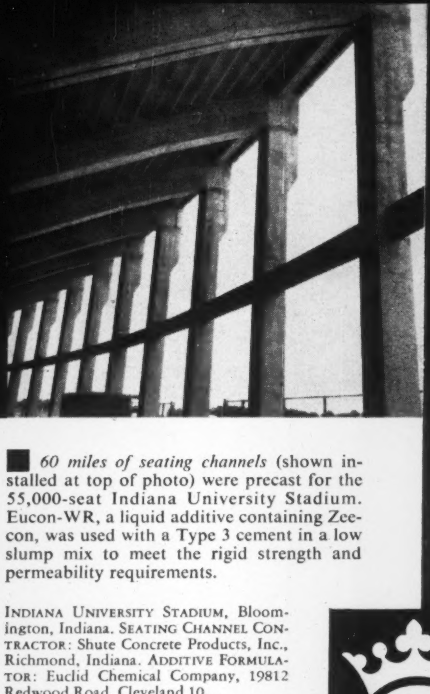
"The additive worked so well", says Mr. Shute, "that we found it necessary to cast holes for the seat brace bolts; no powder actuated equipment could fire a bolt into it! Air entrainment was limited to 3 to 3½%. In every case we attained compressive strength of at least 3000 psi on the morning following pouring, allowing us to maintain uninterrupted production. Bleeding and segregation were greatly reduced, so our finishers were able to start to work sooner and finish faster."

For your next job, we urge you to investigate the advantages of additives containing Zeecon. For further information, write your nearest formulator or Crown Zellerbach.

ZEECON DISPERSANTS are available in a wide range of additives from formulators across the country. Formulations are available in set-retarding or non-retarding grades, with or without added air entrainment. Zeecon in formulations

- Reduces water requirements by 10 to 15%
- Improves workability
- Boosts compressive strength by 25 to 35% at 7 days, flexural by 10 to 15%
- Lowers permeability and water absorption of hardened concrete

For additional information write to your nearest formulator or to Crown Zellerbach.



■ *60 miles of seating channels* (shown installed at top of photo) were precast for the 55,000-seat Indiana University Stadium. Eucon-WR, a liquid additive containing Zeecon, was used with a Type 3 cement in a low slump mix to meet the rigid strength and permeability requirements.

INDIANA UNIVERSITY STADIUM, Bloomington, Indiana. SEATING CHANNEL CONTRACTOR: Shute Concrete Products, Inc., Richmond, Indiana. ADDITIVE FORMULATOR: Euclid Chemical Company, 19812 Redwood Road, Cleveland 10.

CROWN ZELLERBACH

CHEMICAL PRODUCTS DIVISION

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Get all-job economy and top performance with

New John Deere 2010 Wheel Power

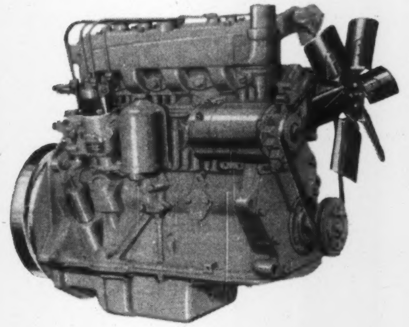
Now reporting for duty on earthmoving and construction jobs of all kinds, new John Deere "2010" Wheel Units provide the advantages of 52-engine-horsepower performance at remarkably low cost. New productive power is combined with high maneuverability and full operator comfort to insure top work capacity on any assignment. Heavy-duty design throughout provides the kind of day-after-day dependability required to hold maintenance costs down, keep projects on schedule.

For home builders, earthmoving contractors, municipalities, whether fleet owners or single-unit operators, versatile new "2010" units are a sound investment. These all-new loaders and equipment combinations are the economical answer to jobs from commercial construction and street repair to handling sand, gravel, or other bulk materials.

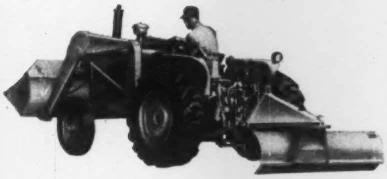
On every job, new "2010" units pay dividends in ease of operation. Power steering helps boost productivity on landscaping, loading and material handling work. New single-lever loader control helps shave seconds off work cycles. Two-lever backhoe control, commanding a responsive, reliable hydraulic system, means top production per hour.

Advanced transmission with constant-mesh gears provides eight speeds forward, three reverse to master any power requirement.

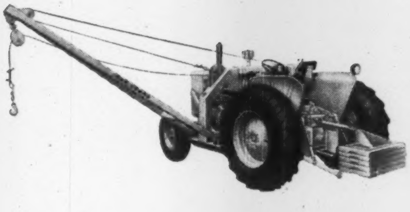
For detailed specifications on new John Deere "2010" Wheelpower, a demonstration on your job, contact your John Deere Dealer through the classified telephone directory. John Deere, 3300 River Drive, Moline, Illinois.



John Deere-built gasoline and Diesel engines feature 4-cylinder, 4-cycle, overhead valve design, high efficiency through a wide throttle range.



A wide choice of power-matched John Deere Landscape Equipment provides start-to-finish efficiency. Disks, rippers, rear blades, a landscape rake, scarifier-scraper combination and landscape seeder provide full versatility. Flail mower also available.



"2010" construction and earthmoving equipment, John Deere designed and built, includes standard and heavy-duty loaders, center-mount and 5-position backhoes, and an all-purpose sideboom unit with hydraulic counterweights for pipelaying work.

JOHN DEERE LOADERS BULLDOZERS BACKHOES AND EARTHMOVING EQUIPMENT

JOHN DEERE

Soil solidification halts water flow in Atlas Missile Base launching silo

Despite adverse terrain and weather, construction of the Atlas ICBM Base (Plattsburgh AFB, N. Y.) was on schedule. Work was proceeding simultaneously on 12, 180-ft-deep silos. Then, on one of the sites 19 feet down (86 feet to bed rock), sheet piling alone proved inadequate to control flowing quicksand and large amounts of water.

Here's how we solved the problem. Silt, quicksand, stones and even large boulders were bound together by chemical soil solidification. The resulting cylindrical curtain of solidified soil around the excavation completely controlled both quicksand and water, allowing construction to continue.

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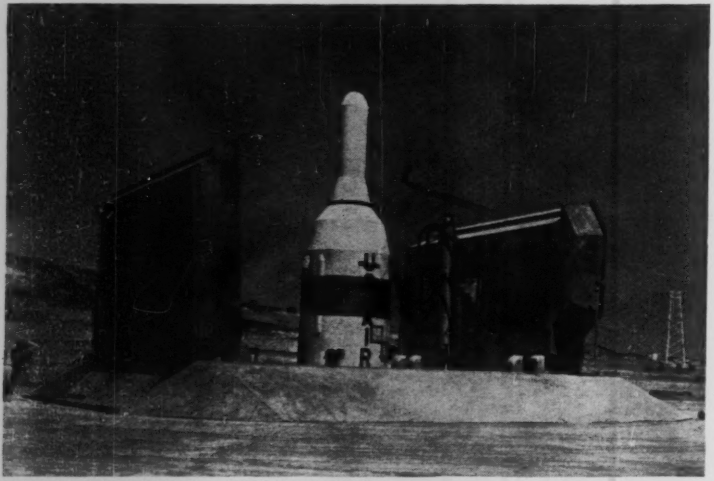

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It Wasn't Clay Pipe

SIR—We wish to call your attention to an error in an article titled Lost Sewage Gives City a Hard Time, in your March 30 issue (p. 23).

The article reported on a sewer failure at Niagara Falls, N. Y., and spoke of "a break in a 42-in. clay sewer serving some chemical plants." Further along the article stated "the pipe had disintegrated."

We question this statement because failures of this kind do not occur when vitrified clay pipe is used. Our investigations revealed that the pipe involved was not clay pipe, but a "segment block sewer."

Vernon Packard, Director of Public Utilities at Niagara Falls, told one of our representatives that he believes the failure was caused by waste acid getting under the sewer and eating away the limestone underneath it with settlement resulting in a hole 30 ft in diameter. Mr. Packard said the clay blocks were in excellent condition but some of the mortar joints had been eaten away.

G. A. ROBINSON
President
National Clay Pipe Manufacturers, Inc.
Washington, D. C.

Silence Not Golden

SIR—I want to congratulate you and your staff in highest terms for the excellent editorial titled We, the People (ENR May 18, p. 232).

There seems to be a general realization on the part of many of our people that the time has come to clean house, as it were, and rid us of immoral practices, including racketeering, payola abuses, common dishonesty and last but not least, infestation of our government by bureaucrats and crack-pots, who meddle in everyone's business and destroy initiative.

As you have stated, the blame must rest largely on those who remain silent, refrain from action.

VICTOR W. BUHR
Clark, Buhr & Nexsen
Norfolk, Va.

Company Amplification

SIR—In your article on Iran (ENR Mar. 9, p. 36) some amplification should be applied to the statement: "It was an M-K report made for Iran back in 1946, in connection with a program for which World Bank loans were to be sought, that led into the formation of the Plan Organization." Actually, the report was prepared by International Engineering Co., Inc. for Morrison-Knudsen International Co., Inc. Both of these companies are fully-owned subsidiaries of Morrison-Knudsen Company, Inc.

LYMAN D. WILBUR
Vice President
Morrison-Knudsen Co., Inc.
San Francisco, Calif.

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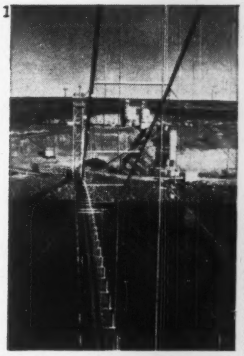

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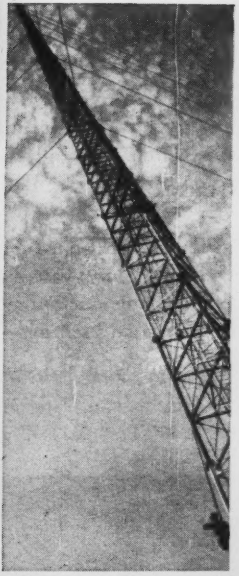

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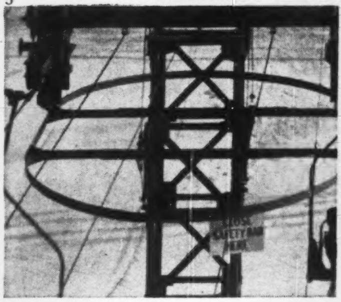

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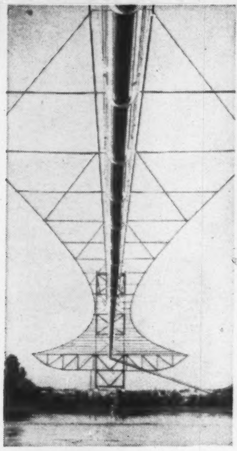

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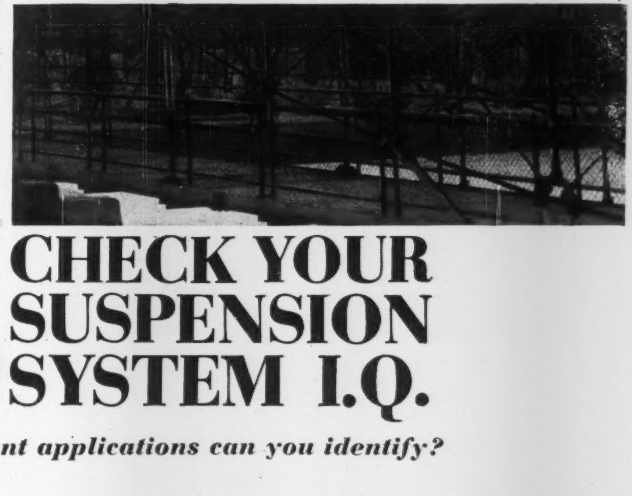

CHECK YOUR SUSPENSION SYSTEM I.Q.

How many of these important applications can you identify?

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Answers to Quiz:

1) *Conveyor Bridge at Pasco, Washington,* 2) *Gymnasium with suspended roof at Central Washington College of Education, Ellensburg, Washington,* 3) *Cable-stiffened suspension San Marcos Bridge, El Salvador,* 4) *1619-ft TV Tower at Portland, Maine,* 5) *Mt. Sunapee Chairlift,* 6) *Pipeline Suspension Bridge, Blythe, Cal.,* 7) *Footbridge with prestressed concrete floor, Lumberville, Pa.*

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

BLATNIK RIDES AGAIN—The House Blatnik Subcommittee opens hearings June 12 into alleged highway irregularties in New Mexico. Committee Republicans still fuss about by-passing Massachusetts. They insist the right-of-way scandal in the President's home state is the most odius in the nation.

OROVILLE'S FEDERAL SHARE—The Corps' South Pacific Division Engineer, Brig. Gen. R. G. MacDonnell, recommends that the federal government's share of California's huge Oroville Dam should not exceed $70 million. He says that the U.S. should participate in flood-control aspects of the project but not in its hydro power. The Board of Engineers for Rivers and Harbors will review the recommendation, probably endorse it. Then it's up to Congress to enact it into law.

THOUSAND DOLLARS A DAY—Kentucky's Water Pollution Control Commission last week ordered the City of Maysville (pop. 8,000) to design and build a sewage treatment plant or go to court and risk a $1,000-a-day penalty. The agency has been after the Ohio River town for 10 years to stop it from dumping raw sewage in the river. The town has until July 18 to tell the state what, if anything, it plans to do.

MISSILE LOCKED IN—The huge booster for the Saturn space missile, to be launched later this year, has been stranded at Redstone Arsenal, Ala., by the break in the lock at Wheeler Dam (see p. 28).

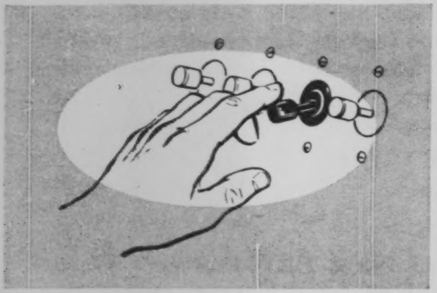
NYC STARTS WASTES SURVEY—The City of New York is checking its 40,000 industrial plants to determine who is dumping what into the city sewers. The study will facilitate enforcement of a new law that prohibits discharge of certain wastes and permits the city to impose surcharges for treating others.

GUESS WHO'S SELLING PEACHES—Next week the Walla Walla District Corps of Engineers opens bids on a prospective 40 to 50 tons of fresh peaches. A 45-acre orchard lies in the John Day reservoir site.

HUNGRY CONTRACTORS—The Denver & Ohio Grande Western Railroad Co. received 140 requests for bidding information on a 39-mi spur planned by the road from Crescent Junction, Utah, to Cane Creek. Estimated cost of project is $5 million.

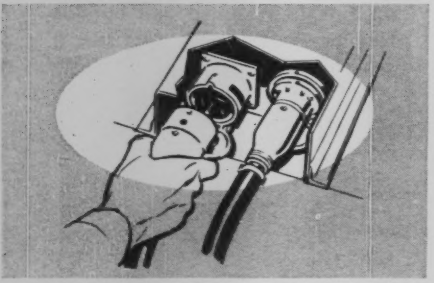
CAN YOU TOP THIS?—A newly formed committee of the Chicago Association of Consulting Engineers may have the longest name on record: Chicago Association of Consulting Engineers Committee for the Study and Pre-examination of Better and Safer Construction Methods for the Protection of Public Health, Safety and Welfare.

Now you can *double* or *halve* your scraper capacity at will . . . tailor your machines for different jobs . . . or adjust any time on the job to meet changing weather conditions, grades, materials, and varying haul lengths. *Tandemizing* is the answer. The idea is not new. Tandem scraper operation has been tried many times, but was never successful with hydraulics and mechanical controls. Now the problem of operating the second scraper efficiently has been solved.



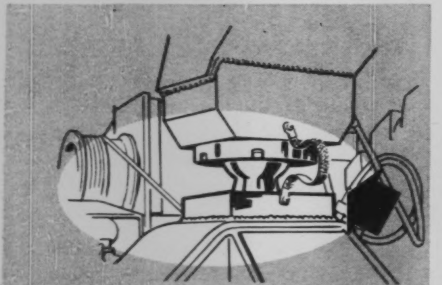
"Electrics" make it practical

LeTourneau-Westinghouse electric-control system transmits power directly to where it's needed via simple, flexible wire . . . *with no power-loss.* Response to apron, tailgate, bowl-hoist control switches is immediate, accurate. Point-of-action motors reach full speed in 3/5 of a second!



Change-over in *minutes*

Once the basic tandem installation has been made, you can add or take off the extra scraper in a matter of minutes. Convenient plugs on "electrics" and air lines are readily inserted into quick-disconnect jacks. Connections are firm, won't part during turns or other maneuvers.



90° angle turn

Rear scraper rides "piggyback" — and turns at a full 90° from front scraper. Pivot-point is a rugged ball-and-socket swivel-hitch at rear of front scraper. You perform any maneuver possible with single scrapers . . . make a full 180° turn in area only 20 to 25% wider than with "singles". Back-up, too, with no jackknifing.

Pocket these savings:

You *double* your capacity *at only about ⅓ additional cost* for the second scraper. You save on operating costs, because *one* man handles *both* scrapers. *One pusher* is all you need, too, and it can be the *same size* you'd use with *one*-scraper operation. And, you save on maintenance, because there's only *one* 'Pull* prime-mover to care for (*one* engine, *one* transmission, *one* final-drive).

So, for a *new* low-net-cost-per-yard, look into LW "2-loads-per-trip" Tandems. Capacities: 18 to 58 yds. Any Tournapull® or Speedpull® can be equipped for tandem flexibility and profits. See us soon.

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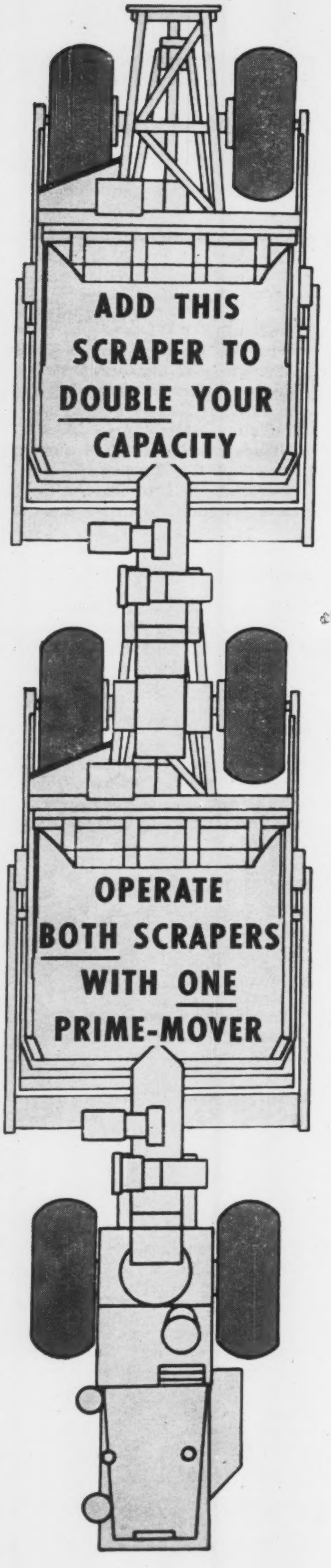
ADD THIS SCRAPER TO DOUBLE YOUR CAPACITY
OPERATE BOTH SCRAPERS WITH ONE PRIME-MOVER

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WASHINGTON OBSERVER

• Four major construction bills are moving: Housing, highways, school aid, pollution control

- **President Kennedy is getting much of the construction legislation he wants out of Congress.** He is making compromises here and there—and will make more. But such major bills as housing, highways, school aid and pollution control are well on their way through the House and Senate—and pretty much intact.

The Administration's omnibus housing bill is being wrapped up in both branches of Congress. As things stand this week, the President is assured of getting virtually everything he asked for in his $4.9-billion program—plus a substantial sum for veterans housing.

Senate action on the measure this week will be followed quickly by House debate. The House Banking Committee already has reported its bill, which shows minor differences from the Senate measure. One of these differences involves Senate approval of an amendment which would make water utilities—public, private and cooperative—eligible for public facility loans. This and other differences will be worked out by a conference committee.

The House-approved bill to provide extra funds to keep the Interstate highway program on schedule is beginning to move through the Senate. The Senate Public Works Committee has approved unanimously and without public hearings Title I of this bill, which authorizes additional federal outlays of $11.5 billion. The Senate Finance Committee is expected to approve Title II after two days of public hearings this week. This will provide for higher taxes to underwrite the additional financing. The Senate probably will complete action on the highway bill and send it to the President within two weeks.

Considerably more controversy rages about the Administration's bill to provide federal aid for public school construction and teacher salaries. Managers of this measure expect to win or lose when the matter comes up in the House next week by perhaps as few as five votes. The $2.5-billion, three-year program already has passed the Senate.

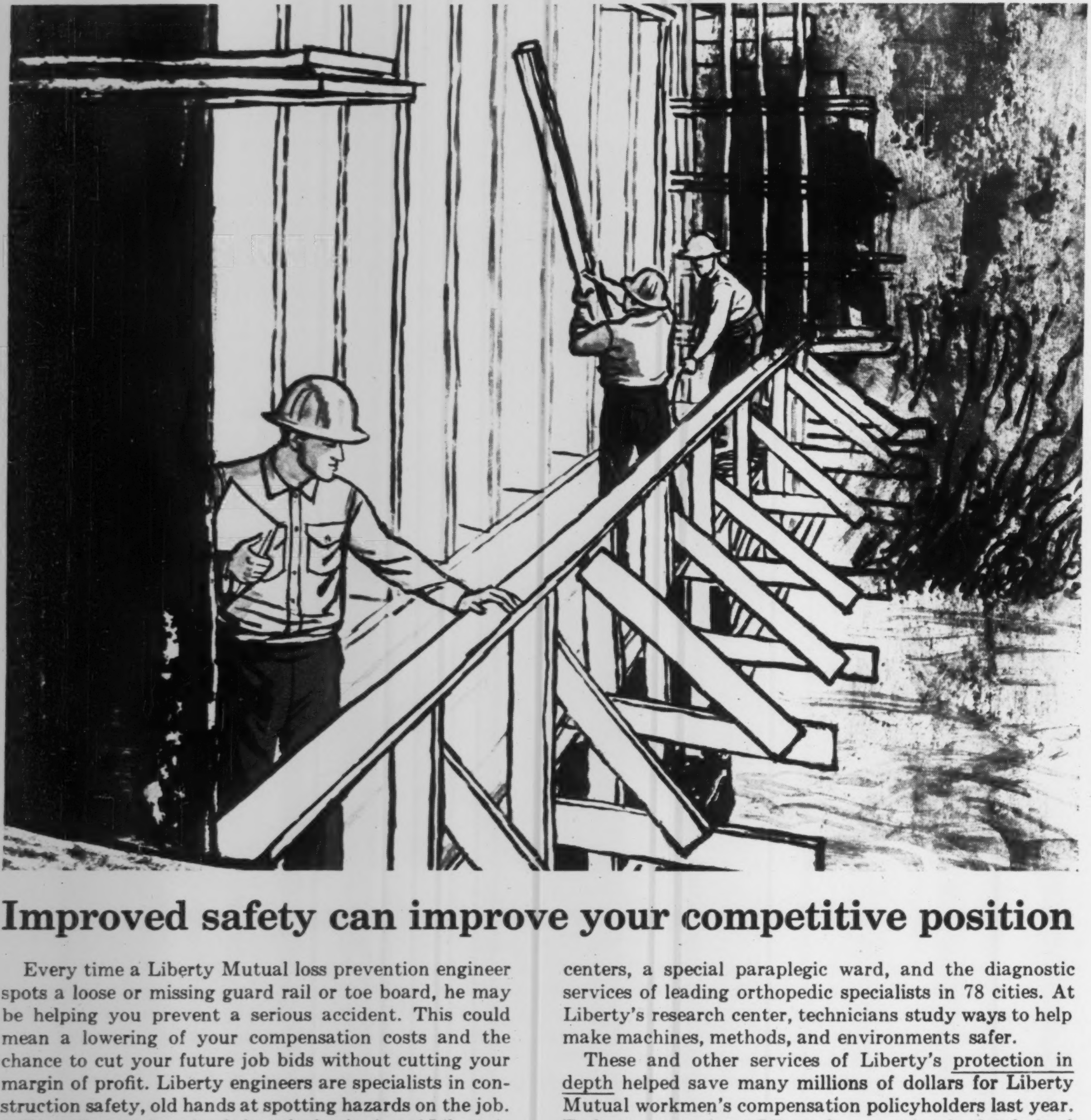
A second bill to provide loans for parochial schools to build science, math and language classrooms may provide the key to success or failure of the major school-aid measure. Catholic leaders would like a commitment from Mr. Kennedy to support the second bill before swinging their aid to the main bill. So far, the White House has remained silent on the subject.

The Senate is likely to cut somewhat the $1-billion, 10-year anti-pollution program approved by the House. The Senate Public Works Committee has come up with a $440-million, five-year program. In any case, however, a substantial increase in the present $50 million a year program is inevitable.

The funds will go to cities and states to build waste treatment plants. The House authorized as much as $800,000 for a single project on a matching grant basis. The Senate committee cut this limit to $500,000. Both bills, however, contain a provision to extend federal authority—at the request of a governor—to navigable rather than just interstate streams.

PROTECTION IN DEPTH

How it helps cut compensation costs



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These and other services of Liberty's protection in depth helped save many millions of dollars for Liberty Mutual workmen's compensation policyholders last year. To learn more about Liberty's protection in depth (and how it can help save *you* money), just call the nearest Liberty Mutual office.

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JUNE 8, 1961

ENGINEERING NEWS-RECORD

What JFK's Foreign-Aid Bill Offers

- **The Kennedy program, now before Congress, asks for new foreign-aid agency empowered to lend $9 billion in five years.**
- **It could mean a sharp boost in the amount of overseas construction available to American contractors and engineers.**
- **But Congress may balk at its higher sums and back-door financing that bypasses congressional appropriations committees.**

The new Kennedy foreign-aid program, now before Congress, would provide a sharp boost for construction of all kinds around the world if voted by Congress in more or less its present form.

The heart of the program, and its most novel and controversial feature, is the request for authority to draw nearly $9 billion from the Treasury over the next five years to finance long-term overseas economic development.

These funds would be made available to developing countries in the form of loans repayable in dollars but over periods of up to 50 years and at very low rates of interest. They would be in addition to continuing grants to meet short-term economic needs totaling between $1.5 billion and $2 billion a year and continuing military aid to U. S. allies of around $2 billion a year.

Other aspects of the proposed foreign-aid program would also stimulate construction activity.

There will be an all-out effort to enlist the participation of private U. S. concerns in the over-all development job through provision of much more liberal guarantees and loans to private U. S. investors. The resulting increase in private U. S. investment in underdeveloped areas inevitably would stimulate building of many types of facilities.

Of potential direct interest to U. S. construction firms is the announced intention of the proposed new consolidated foreign-aid agency—the Agency for International Development (AID)—to subcontract development projects where feasible to private U. S. firms.

Construction firms might well be eligible for such contracts as river development, highway networks, port expansion. Beyond that, the new program proposes to pay for 50% of the cost of studies to determine the feasibility of proposed private investments in underdeveloped countries, and these could involve engineering services.

In another area, heavy emphasis on so-called "social development" in the proposed new aid program promises to give higher priority to projects which would involve substantial construction activity.

Land reform and reclamation programs, for example, calling for resettlement of large numbers of people clearly would involve in most cases building housing, schools, medical facilities, water systems, access roads, etc. While much of the actual work presumably would be done by local construction firms using local labor, a need for U. S. engineering services might well arise.

But the most important part of the President's request clearly is his proposal that AID be authorized to borrow funds directly from the Treasury up to specified annual ceilings over the next five years. The ceiling would be $900 million in fiscal year 1962 and $1.6 billion in each of the four succeeding years. Any portion of the authority not used in any given year would remain available in later years.

In addition to this direct borrowing authority, the Administration is requesting the right to re-lend to developing countries funds received from foreign governments in repayment of our loans. Such repayments will amount to roughly $300 million a year over the next five years. If approved, the repayment in effect would amount to a long-term revolving fund for financing economic growth in underdeveloped areas.

The requested long-term borrowing and re-lending authority would give the Administration a much more effective and flexible tool for stimulating construction of all types—in the developing countries.

In the first place, the funds available for this purpose would be much larger than before. The Development Loan Fund, which will be merged with the International Cooperation Administration in the new Agency for International Development, has been the main U. S. government source in the past of long-term easy payment lending for development. Annual appropriations for the DLF have averaged only about $600 million. The new long-term borrowing authority plus the power to re-lend sums repaid on earlier foreign loans would give aid, almost $2 billion a year, to lend for development from 1962 on—more than triple the amounts available in recent years.

Beyond that, by making it possible to put the economic aid program on a long-term basis the requested borrowing authority should stimulate development in two ways.

First, it will permit the new aid agency to assure the governments of developing countries in advance that financing for major long-term development projects will be available over a long period of time. Such assurance often is essential to encourage foreign governments to launch long-term projects.

Second, the hope is that the possession of long-term financing authority will give the new aid agency a powerful lever with which to persude governments of developing countries to plan their development and marshall their own resources more effectively.

If the new approach works in practice, it would mean that the resources available for development would be increased by more than the increase in U. S. aid.

To be sure, even under the best of circumstances, some short-term emergency aid would now and then be necessary for countries which had not planned their development effectively. But the thought is to reduce this progressively until it is below the level of political comfort for the recipient governments.

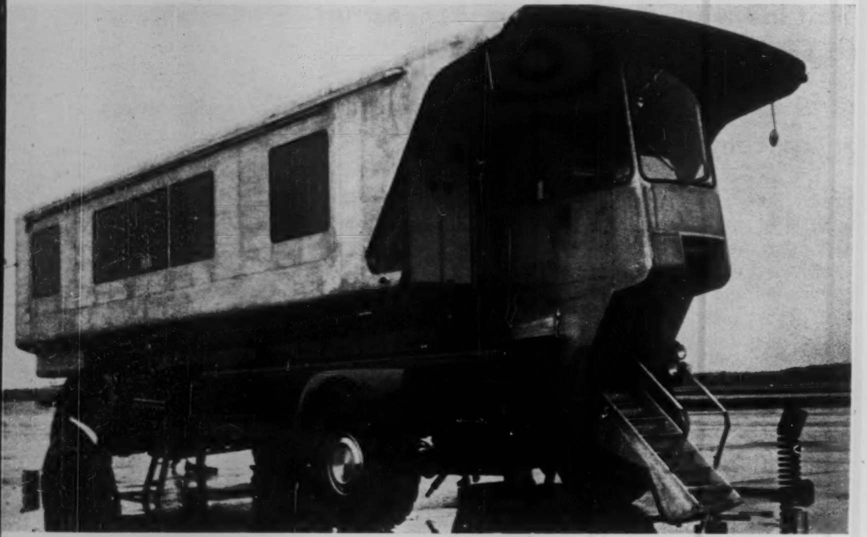
It is impossible to predict with precision just how much of the expected expanded spending for construction around the world may be earned by U. S. construction firms.

They will be in competition, as in the past, with local construction companies and those of other economically advanced countries. The Administration, however, will continue to earmark most of aid funds for procurement of U. S. goods and services in order to ease the strain on the balance of international payments. This means U. S. firms will have the inside track, at least on projects financed under the new aid program.

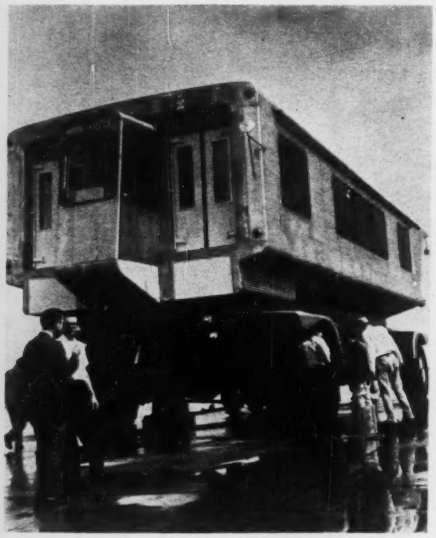
The Kennedy aid bill faces rough sledding in Congress.

Conservative congressmen oppose not only granting substantially larger sums for foreign aid, they also oppose in principle giving the executive further authority to borrow directly from the Treasury, bypassing congressional appropriations committees. They insist that this encourages financial irresponsibility on the part of the Administration even though Congress would retain its right to review aid programs annually and cut back or even abolish the new aid agency's borrowing authority.

But Kennedy aides are hopeful that in the end Congress will grant the President most of what he wants. They believe that the increasing gravity of the international situation will swing votes behind the aid program. And they hope

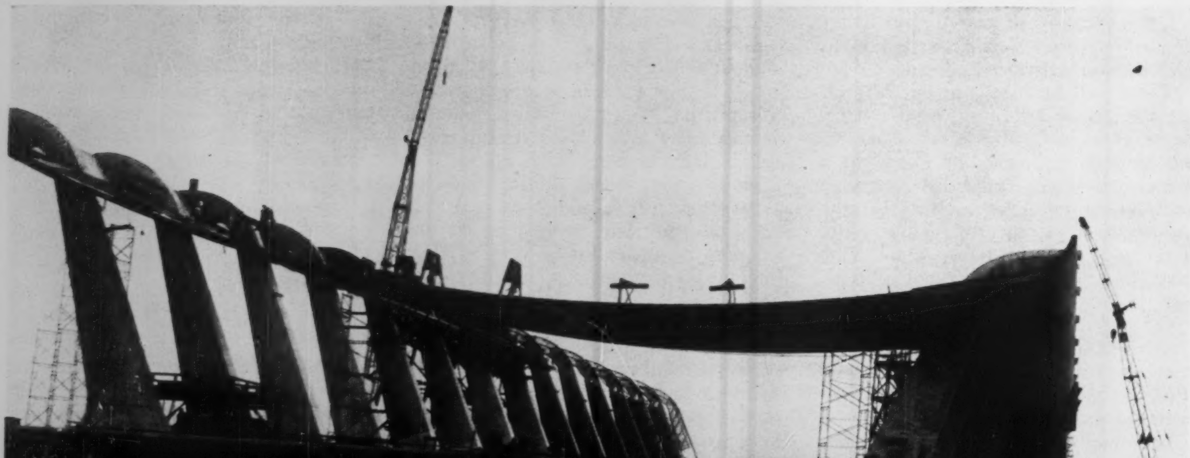


Traveling lounge connects with planes at this end.



This end joins with terminal.

Mobile Lounge Mobilizes Dulles

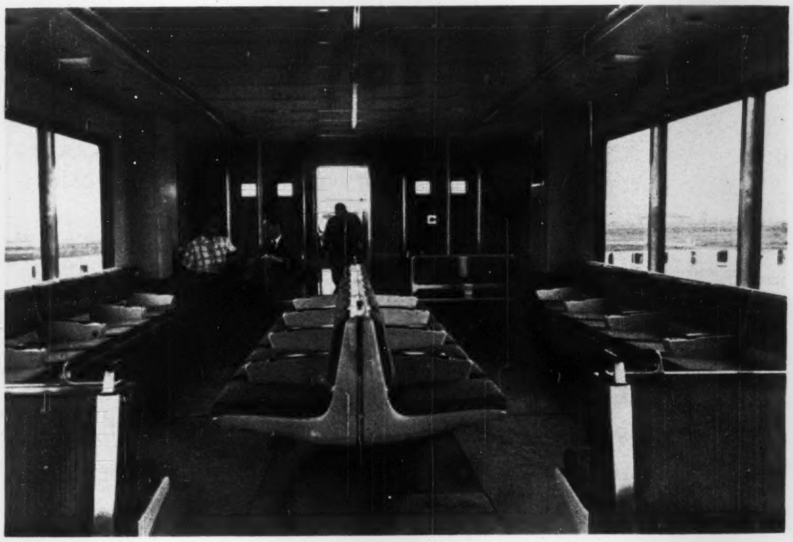


Concrete columns of Dulles Airport will support cable-slung concrete slab roof.

that the positive new look which President Kennedy proposes to give to the program will win for it more enthusiastic support from internationally minded congressmen.

Officials note, for example, that Sen. J. William Fulbright (D., Ark.), chairman of the Senate Foreign Relations Committee, Sen. Hubert Humphrey (D., Minn.) and others two years ago sponsored a foreign-aid bill which incorporated the essence of the long-term Kennedy approach. President Eisenhower threw his weight against the bill and it was narrowly defeated in the Senate. Since then, many of the supporters of foreign aid in Congress have given only perfunctory support to it. Now it is hoped that they will get out and fight for the new program.

Officials also point out that the request for long-term borrowing authority will not have to be passed on by the congressional appropriations committees which are the main strongholds of the opponents of foreign aid.



Lounge is air-conditioned, accommodates 90 persons.

Airport Critics

The mobile lounge, a vehicle that looks like a railroad dining car married to a tractor-trailer, rolled into Washington, D. C., last week to haunt Federal Aviation Agency chief Najeeb E. Halaby.

The mobile lounge is designed to shuttle passengers between airliners and the terminal building at Dulles International Airport, now under construction for FAA outside Washington.

Mr. Halaby refers to the lounge as: "a legacy not received with the greatest glee from the previous Administration." He questions its cost and practicality.

Chrysler Corp. had a $750,000 contract for design and construction of a prototype lounge on a cost-plus-fixed-fee basis, but the eventual cost is expected to be nearly twice that amount.

Plans call for 20 of these lounges to operate from the Dulles terminal. Subsequent lounges will cost $240,000 each. They will weigh 78,000 lb and have a top speed of 26 mph.

A further concern to Mr. Halaby is that the lounge is experimental, but it must be incorporated into an operational airport without a lengthy advance evaluation. He has advised other cities not to adopt it at this time.

But these are minor worries for Mr. Halaby. He told a House appropriations subcommittee recently that the international airport that was originally scheduled to cost $85 million and be finished by July 1 will really cost $105 million and not be operational until October 1962. It will take another $70 million to develop Dulles Airport to meet the traffic needs of 1975, he said.

Mismanagement and poor planning were responsible for the increase in cost and construction time, Mr. Halaby told the congressional group.

Instead of the usual terminal with sprawling fingers, the Dulles terminal will be a compact, rectangular (600 ft x 150 ft) building. Passengers will step from the terminal into the mobile lounges that will carry them out to jet airliners waiting in service areas about one-half mile away. Passengers will walk from the lounge to the plane on adjustable ramps that will mate with the plane entrances.

Consultants Settle

Engineers pay $150,000 to replace collapsed sewer

The consulting engineers in a Little Rock sewer job have paid $150,000 through their insurers to replace several hundred feet of new line that collapsed last year before going into service.

Negotiations began after a three-man arbitration board decided (2-to-1) last December that the collapse was not the result of faulty workmanship and/or materials. Parties to the arbitration were the Little Rock Sanitary Sewer Committee and the W. K. Ingram Construction Co., of West Memphis, Ark., the contractor.

Burns & McDonnell, of Kansas City, Mo., who designed the project and supervised construction for the sewer committee, contended that faulty workmanship and/or materials caused the failure. The arbitrators rejected this argument in exonorating the contractor. However, they cited no specific errors of design or construction, nor did they blame any person, agency or company.

The failure involved about 400 ft. of 60-in. concrete pipe with 6-in. walls. The collapse came to light during the sewer committee's acceptance inspection in May 1960. Sewer Department Manager T. W. Clapham estimated the pipe had been installed about six months.

Mr. Clapham said the arbitration board held that a pocket of quicksand beneath one section of pipe caused it to collapse. Groundwater flowed into the break under a 12-ft head (water table was 20 ft below ground surface, the pipe 32) and eroded the support from adjoining sections until the failure had progressed about 200 ft in each direction. The pipe rested on concrete cradles, Mr. Clapham said.

After discovery of the collapse, the contractor repaired the line at the direction of the engineers, Mr. Clapham said. The arbitrators ruled that he should be paid $194,000, including arbitration and legal fees. By previous agreement, the board's decision could not be appealed.

The Little Rock Sanitary Sewer Committee negotiated the settlement with the engineers' errors-and-omissions underwriter, the Fidelity & Casualty Co., of New York. The sewer committee paid the contractor the amount not covered by the settlement. The engineers did not retreat from their previous contention that their design was not to blame, Mr. Clapham said.

Under the contract provisions for an arbitration board, each side named one member and the two members so selected named a third.

Concrete

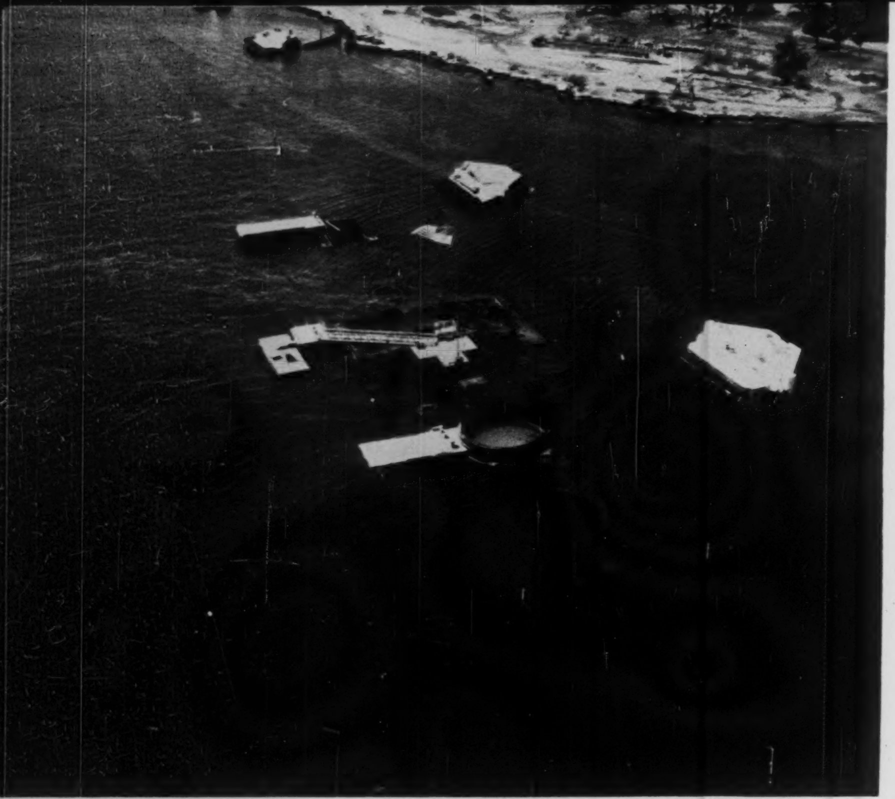
A concrete monument, to resemble the flying bridge of a ship, is under construction at Pearl Harbor just above the sunken hull of the USS Arizona. It's a memorial to the ships sunk and the men who died there on Dec. 7, 1941.

When finished, the offshore structure will carry a chapel at one end and a museum at the other. Visitors will look down from the concrete platform to see the sunken battleship that is the permanent tomb for the 1,102 men that went down with it.

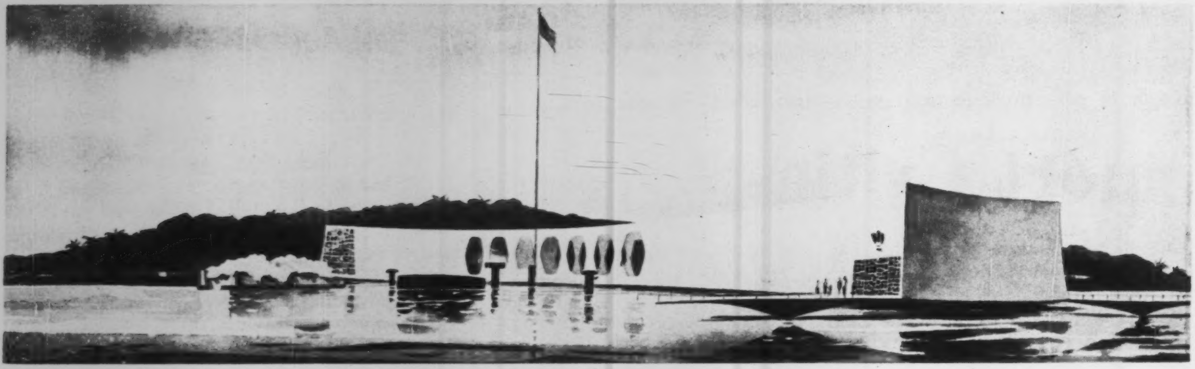
Crews of the Pearl Harbor Naval Shipyard are building the concrete memorial.

The Arizona Memorial spans 111 ft between the center lines of pile clusters on either side of the sunken battleship. Its platform cantilevers another 37 ft beyond the pile supports for a total length of 185 ft. It is 36 ft wide at each end, but tapers gently to 27½ ft at its middle.

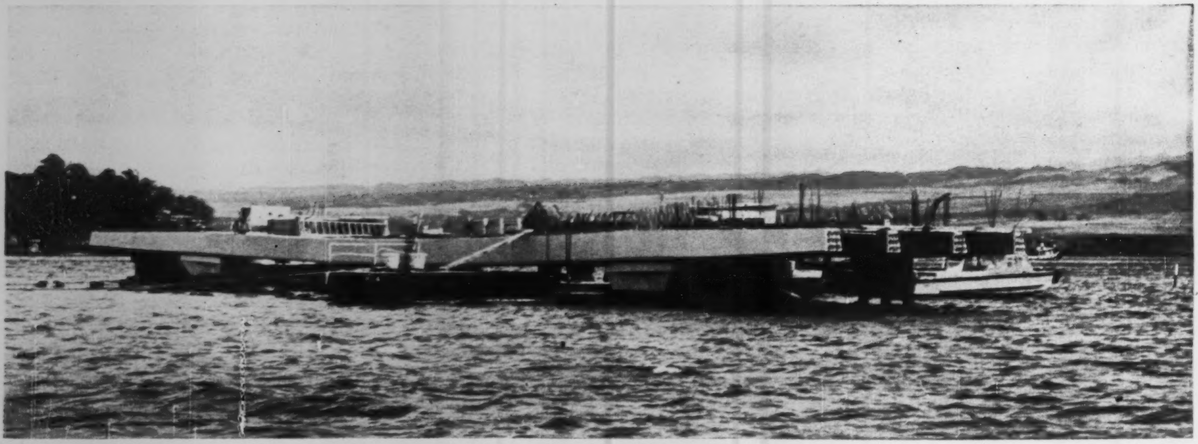
The USS Arizona lies where it sank 20 years ago in 40 ft of water. Under



Over the ghostly hull of the sunken USS Arizona . . .



in Pearl Harbor, this combined shrine and museum . . .



will rest on curved and tapered prestressed concrete beams 185 ft long.

Memorial Bridges Sunken Ship

the ship is 40 ft of soft mud; below that is a stiff clay. The 175-ft piles were driven 90 ft into the clay.

Four prestressed concrete beams supporting the platform are curved; they resemble two pairs of parentheses placed back to back. Shipyard crews cast the 185-ft beams ashore in half lengths with two half-length beams joined in a single casting that weighed 138 tons. A 175-ton floating crane lifted them from the forms, carried them to the job site, and set them in place. At the platform's center where the beam-halves are joined, they rested on falsework while a 6-ft-long section was cast in place to join them.

Casting the beams on shore saved money by reducing over-the-water man-hours. A single set of plywood forms faced in sheet metal served for all four castings.

The first section out of the forms gave the big shipyard crane quite a tug—before the bond between the concrete and the forms was broken. For the other three sections, salad oil, obtained from a nearby Navy mess, coated the forms; the curved concrete beams slid out easily.

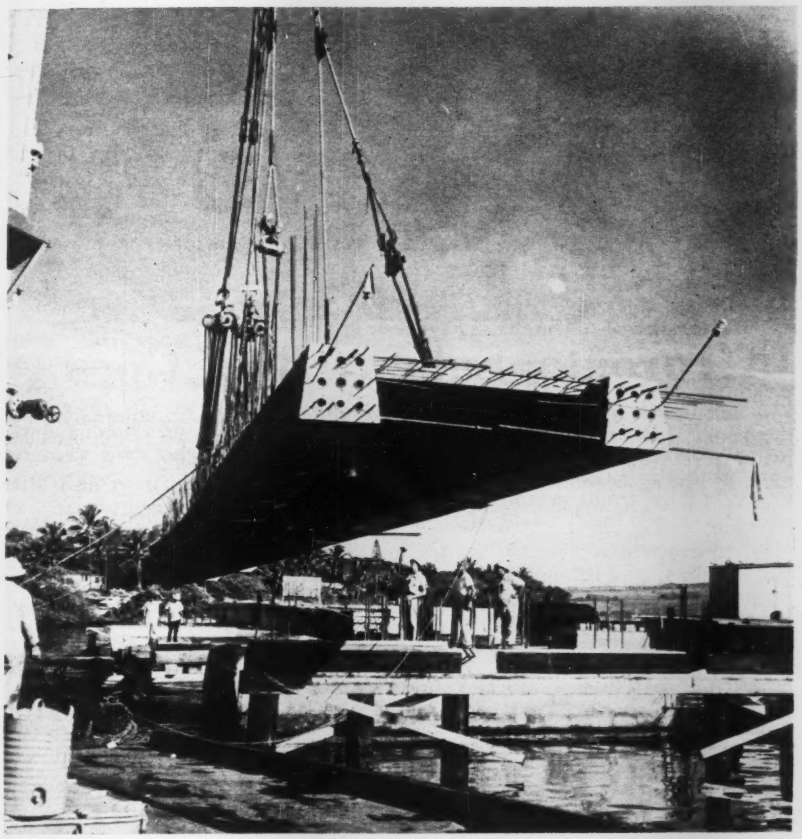
Prestressed concrete planks—4 in. thick and 2 and 3½ ft wide—were also cast on shore. Spanning the beams as the platform of the structure, these planks will carry a 2-in. thickness of cast-in-place concrete.

Sponsors have been collecting money to build this memorial for some time and still need more than $100,000 if the job is to be finished. There seemed enough in the kitty to take bids on the platform for the shrine in mid-1960. But when the single bid received exceeded the money available, the Navy rejected it and awarded a contract instead to Pearl Harbor Shipyard forces and went to work.

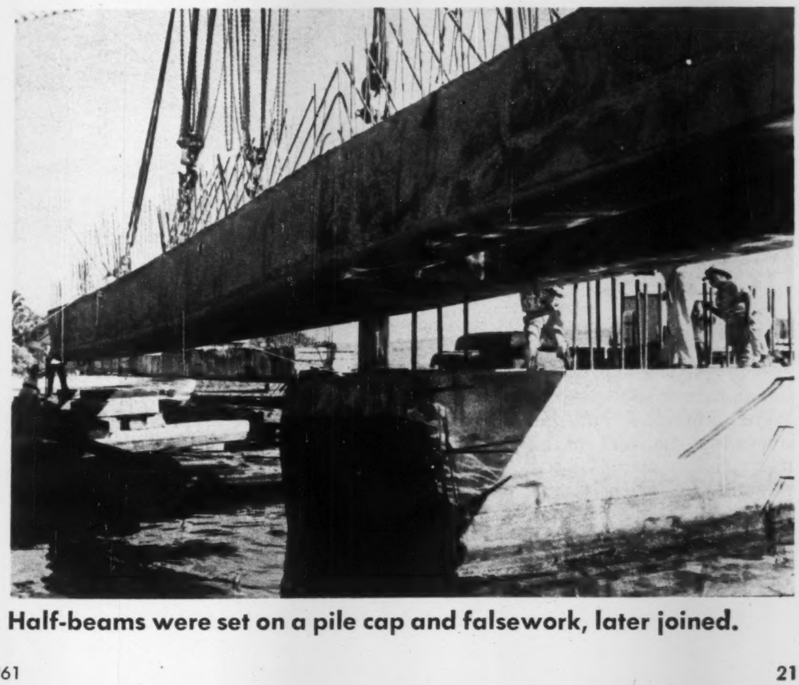
The Pacific War Memorial Commission—an agency of the State of Hawaii—is sponsor of the project. The Navy's Bureau of Yards and Docks has administered the work for the Memorial Commission.

Johnson & Perkins and Preis, Honolulu architects, designed the memorial; Alfred A. Yee, also of Honolulu, did the structural design.

For the Navy, Capt. N. M. Martinsen, Public Works Officer of the 14th Naval District, has supervised the project; Capt. George H. Thompson, Shipyard Public Works Officer, has directed construction forces. Rear Adm. E. J Peltier is chief of the Navy's Bureau of Yards and Docks.



Floating crane moved precast members from shore to site.



Half-beams were set on a pile cap and falsework, later joined.

In Toronto: Subway Roof Goes

A coroner's inquest will be held on the Toronto subway collapse that killed two men on May 26, and no report of cause will be made before the coroner's work is done. The inquest is scheduled for June 26; the report will follow.

Green concrete in a freshly cast section of subway roof fell on the two men while a third worker barely escaped, uninjured. The three, employees of McNamara-Raymond Construction Co. of Toronto, were inspecting jacks supporting roof forms when the accident occurred.

Contractor representatives insist that normal safety requirements were met and that all work was in strict compliance with the job specifications. W. H. Patterson, chief engineer for the Toronto Subway Commission, told ENR he cannot discuss the collapse until the coroner's report is filed.

In Paris: Undercut Area Drops

Collapsing buildings killed 20 persons and injured 45 others when the ground caved in last week in Clamart, a Paris suburb.

The failure of underground pillars supporting the roof of an old chalk quarry gallery over 100 ft below grade apparently caused the cave-in. The chief engineer of the Seine Department Quarry Inspection Service said heavy rainfall in late May weakened the pillars.

Collapse of the first pillar apparently triggered the collapse of other pillars in sequence. The cave-in forced air out of the gallery at speeds of 60 mph, raising so much dust and noise that the residents first thought that an explosion had occurred.

Inspectors are keeping the remaining quarry gallery under close surveillance, but they consider the chances for further cave-ins remote. The remaining pillars, which are over 30 ft wide, show no fissures. The collapsed pillars were only 13 to 20 ft across.

Estimated cost of plugging the galleries to remove the threat of cave-ins is prohibitive.

In Philadelphia

Graft and fraud charges bring arrests and firings

Charges of graft and overcharging on Philadelphia municipal contracts brought more than $10 million worth of construction contracts under official scrutiny in search of possible additional malfeasance.

Already bound over in bail for action by the Philadelphia County Grand Jury are two city officials and three executives of a transportation company and two construction companies. They are accused of bribery and conspiracy. In addition, six city employees were fired by Mayor Richardson Dilworth.

The city also filed suit for recovery of $1.8 million from Philadelphia Transportation Co., operator of the city's transit system. The city contends the company overcharged for work done or charged for work never done.

Bound over for grand jury action were, John E. Francis, deputy public property commissioner; Harold V. Varani, chief of the Bureau of Architecture and Engineering; Benjamin D. Barone, former confidential assistant to the city's public property commissioner; George H. Smith, Jr., retired assistant vice president of Philadelphia Transportation; and Eli G. Travis, owner of two, now bankrupt, construction companies. Mr. Travis allegedly distributed $100,000 in cash and merchandise to city and transportation company employees.

In New York City

School building inspector suspended; 30 face quiz

New York City's Board of Education last week suspended an inspector in its Bureau of Construction after he reportedly admitted taking about $3,000 in cash from 24 mechanical contractors. The companies were ordered barred from doing business with the city pending further investigation.

About 30 other employees of the school board, including inspectors and engineers, face questioning by the city's investigation commission and also a special State Investigation Commission. They are suspected of accepting gifts from contractors holding school repair and building contracts.

The city's Building Department recently came under fire from the same state commission, which reported payments by general and specialty contractors to inspectors. Since then, the department brought charges against 90 of its inspectors.

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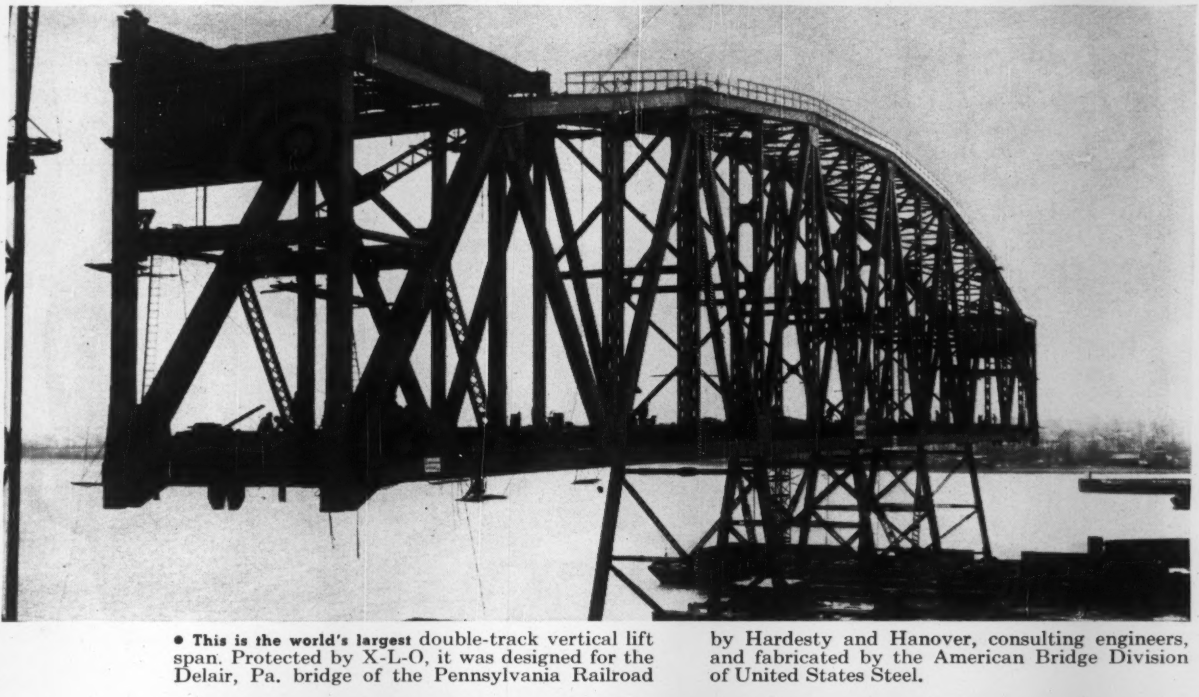

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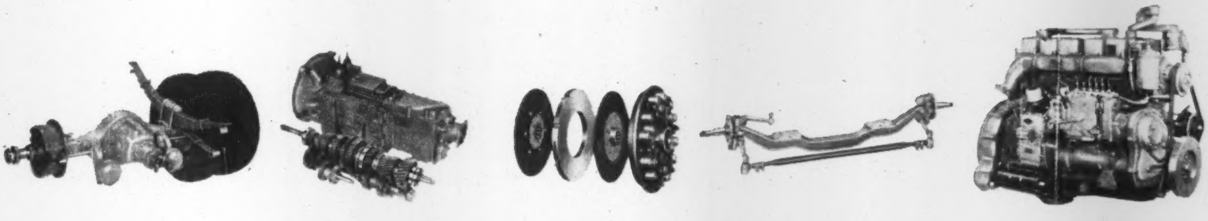

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The Corps' General Welling declares . . .

Base Construction: On Schedule

"We're all very pleased with construction schedules." That's the Corps of Engineers' Brig. Gen. Alvin C. Welling speaking.

He wasn't so pleased 10 months ago when the Corps of Engineer Ballistic Missile Construction Office came into being and he took over. Base construction lagged then.

He wasn't so pleased six months ago, either, when ENR first interviewed him in depth on his responsibilities for getting base building on schedule (ENR Nov. 10, 1960, p. 21).

But interviewed again last week, General Welling claimed that virtually every silo, complex and base now under construction will be turned over to the Strategic Air Command right on Air Force schedule—or even a bit sooner in many cases.

Operational dates for missile bases are classified. So far as construction is concerned, however, every base already started for an Atlas, Titan or Minuteman ICBM will be completed within the next 18 months or so. A number already are finished, of course.

Everyone—not just General Welling—is pleased. One civilian employee of his CEBMCO headquarters in Inglewood, Calif., says, "There has been a noticeable letdown in pressure lately, all because everything is going so well—finally."

The Associated General Contractors, in the April issue of THE CONSTRUCTOR, said confused and conflicting reports concerning the ICBM base program "have obscured a story of accomplishment now emerging."

"The truth is that the over-all ICBM base construction program now is essentially on schedule," AGC reported, "and that finished launchers and their support facilities are being delivered to the Air Force at the rate of at least one per week."

AGC had nothing but praise for "the dedicated, timely performance" of General Welling's operation and the construction contractors involved for putting the program back on schedule.

No one denies that there have been delays. But the construction job will run into well over $1 billion when it is completed, and it is a complex task with virtually no precedent.

"We are still constructing, developing and designing at one and the same time. The tempo is tremendous, and construction involves the utmost of precision," says General Welling.

These things, in addition to the labor problem, caused delays—serious ones.

"Contractors have cooperated

. . . and I've been demanding."

But conditions began to straighten out—partly through the evolutionary acquisition of knowledge, perhaps, but mostly through hard and knowledgeable work—after the massive administrative reorganization undertaken last August.

The Air Force was placed in direct charge of the missile site program, from beginning to end. Its Ballistic Systems Division under Maj. Gen. Thomas P. Gerrity has CEBMCO under its wing. General Welling is a deputy of General Gerrity.

Despite the fact that he is working for the Air Force, under the nominal command of an Air Force general, General Welling has been given more actual authority than any other Corps of Engineer officer in history on a similar project. He is responsible not only for the construction of missile bases but also for the installation and checkout of the missile. Only then does he turn the silo or base over to the Strategic Air Command. SAC officers, of course, work at the bases during the final stages of construction and the installation of the missiles, so that they can be completely familiar with all phases of the operation.

General Welling has Col. Thomas P. Hayes as his deputy, vice-commander of CEBMCO. And he has gathered into CEBMCO four of the best construction officers he could find and delegated to them all the authority, for individual programs, that the Air Force invested in him.

Col. Charles C. Noble is in direct and full charge of all Atlas D and E bases and the Minuteman complex at Great Falls, Mont.; Col. Carlin H. Whitesell has complete authority over Titan I sites; Col. Carroll H. Dunn is in charge of Titan II bases, and Col. Woodrow H. Wilson has supervision of Atlas F sites.

General Welling personally selected all four men because of the superior jobs they did on their previous assignments as district engineers. Colonel Whitesell was in charge of the East Ocean District, responsible for off-shore construction in such areas as Greenland, Iceland, the Azores, Newfoundland, Labrador and Bermuda. Colonel Dunn was his assistant. Colonel Wilson was District Engineer at Detroit, and Colonel Noble held a similar post at Louisville.

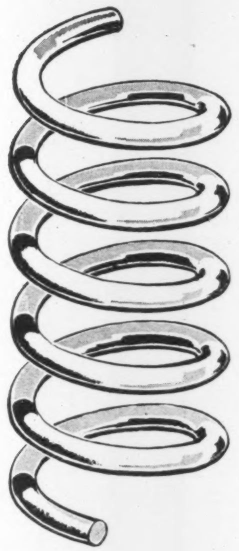
Back at the Pentagon, these men are known as "vice presidents" or "Lee's lieutenants" (Robert E. Lee assigned unusual authority to his subordinates). One Air Force officer, looking over CEBMCO, said: "Never in peacetime history have we assembled so much officer talent in one office."

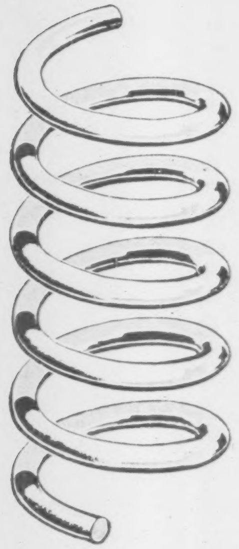
The extensive authority granted to General Welling and, through him, to his "vice presidents" is to a great extent the reason for the apparent success of the construction program since last August's reorganization.

Placing an Engineer colonel in charge of each weapons system eliminates all middlemen. They are in direct charge of all bases for their specific weapons systems and report only to General Welling. He, in turn, has only to keep his Air Force superiors completely informed as to problems and progress.

The result is twofold: Uniformity of contract administration is assured, and the lessons learned at "upstream" proj-

(Continued on p. 28)





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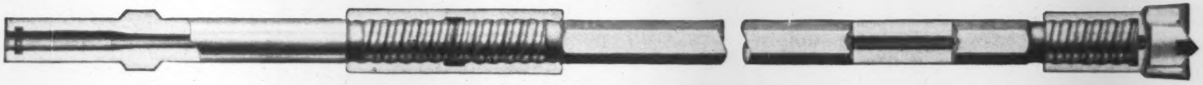

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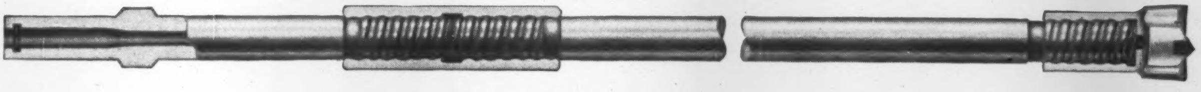

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ects make construction of later bases all the easier.

"Everyone," says General Welling, "knows exactly what his job is—and does it. I refuse to admit to any waste in the entire program. I will admit to imperfections. But, under this setup, we have the ability both to recognize them and to overcome them."

The chief way General Welling and his aides have overcome early construction delays is by a system of "joint occupancy." Missile bases are built in three general phases: (I) heavy construction, (II) installation of equipment, and (III) installation and checkout of the missile.

At almost all sites that are far along, construction activity was going forward on both Phases I and II simultaneously. In some cases, there even was some overlapping in Phase III.

General Welling cites construction of the Atlas E base at Cheyenne, Wyo., as a perfect example of this plan. The Air Force had directed completion by June 1 of this year. There were some early delays. But through "joint occupancy," completion of the last of nine launchers was accomplished by May 1.

General Welling has nothing but praise for the contractors who have worked on the various intercontinental ballistic missile sites.

"I've been extremely demanding of them," he reports, "and they have been wonderfully responsive."

Wheeler Lock Collapses, River Traffic Halted

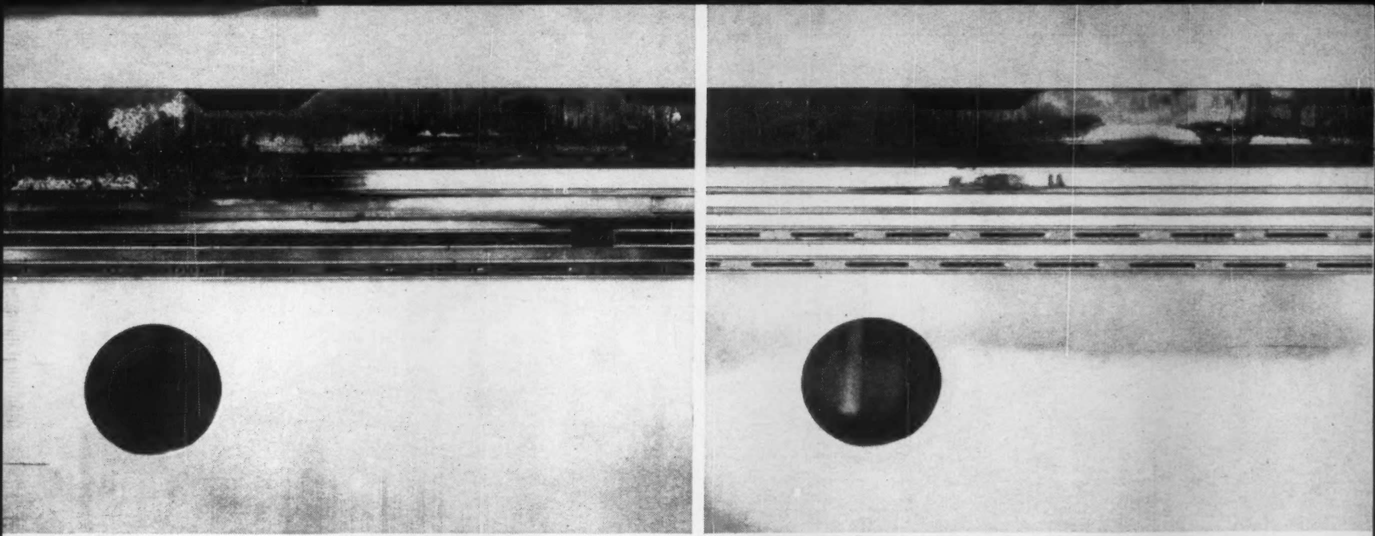
A major portion of the massive concrete, shoreward wall of 27-year-old Wheeler Lock on the Tennessee River collapsed into a cofferdammed work area last Friday. A Tennessee Valley Authority man working in the cofferdam, and a riverboat crewman standing on a downstream guide wall, were lost to the swirling waters.

A barge tow had just locked through and the upstream vertical-lift gate was open. The 60 x 360 ft chamber was full. River and reservoir levels were normal.

Suddenly, two 40-ft-wide gravity concrete sections of wall flopped over into the cofferdam where TVA is building a new 110 x 600 ft lock. Other sections followed. The downstream miter gates were wrenched open when the wall went. One of these slammed the guide wall, the other washed downstream.

TVA engineers have lowered the reservoir 7 ft and are installing a timber bulkhead ahead of the upstream gate. When this is in place they hope to lower the gate, extend the construction cofferdam to enclose the lower end of the lock and dewater.

TVA made no immediate estimate of damages, but said the lock would be out of service for "many months."



Left: Poor performance of competitive diesel lubricant is easily noted on piston rings.
Right: Superior cleanliness—typical of Shell Rimula Oil performance.

BULLETIN:

Shell reveals how Rimula Oil saved a road construction company $37 per diesel engine on each drain period

A leading road construction company tested Rimula® Oil on a freeway job.

Object: to find an oil that would overcome two key problems in its heavy-duty diesel operations.

1. Heavy engine deposits. 2. Short oil drains.

Read how Shell Rimula Oil tackled these problems, kept the project moving at high speed—and helped to cut overhead.

A LEADING road construction company was having two costly problems with its supercharged diesel engines. Deposits were impairing engine performance. Oil drains were required every 80 hours—far too often for economical operation.

To fight these problems, the company switched to Shell Rimula Oil. After 2000 hours of operation in these same diesel engines, the oil's performance was evaluated.

The company's lube foreman reports these cost-cutting results:

1. Improved engine performance. Shell Rimula Oil greatly reduced lacquer and valve deposits.

Valve mechanisms, bearings, pistons, rings and crankcase were notably free of deposits.

Higher engine efficiency helped the company meet production levels and hold to its maintenance budget.

2. Longer drain periods. With Shell Rimula Oil, the 80-hour drain period was extended to 400 hours. Five times as long.

This saved $37 on labor and oil costs alone, on each engine, each drain period.

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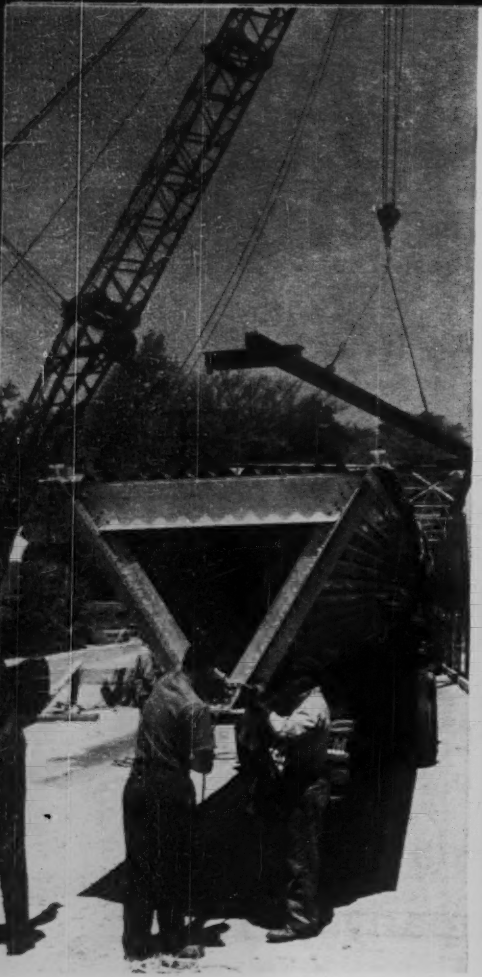
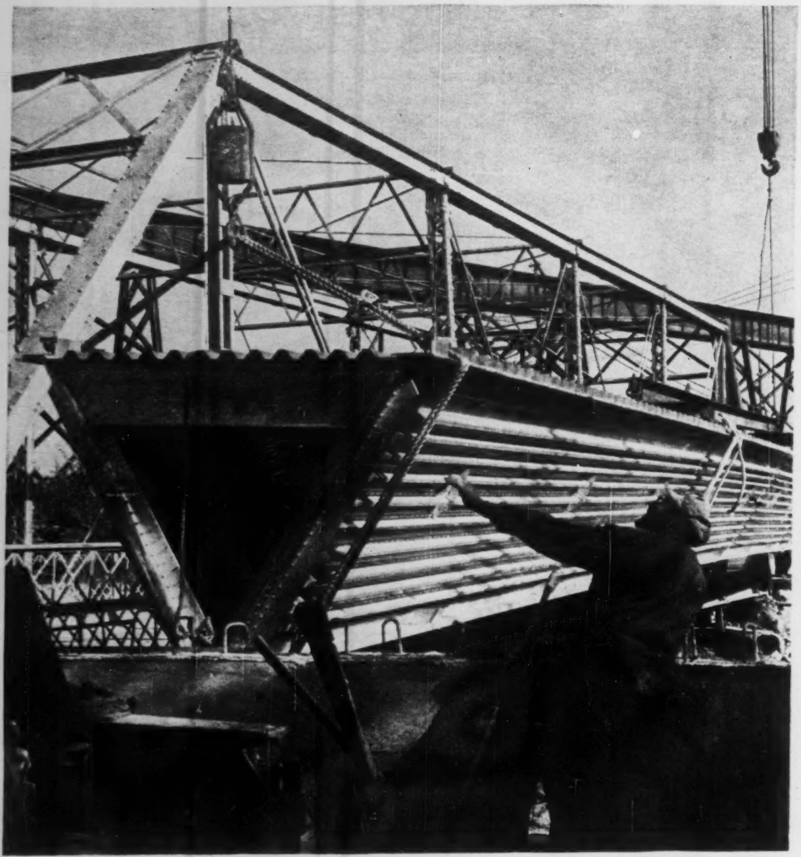


Girder rides to site on truck.



Crane lifts girders directly to abutment seating assembly.

Aluminum Bridge: A Lightness at

The country's first sheet aluminum bridge, a down-to-earth application of aircraft principles, will be opened to traffic in August. It's a 97-ft span over the Appomattox River, on Route 36 near Petersburg, Va.

Basically, the bridge consists of five triangular girders built up from aluminum extrusions and sheet aluminum. These girders are designed like the body and wings of an airplane. The thin aluminum sheet that makes up the sides is as essential to the girders' structural strength as the aluminum extrusions that make up their framework.

The designers of the bridge, the Product Development Division of Reynolds Metals Co., Richmond, Va., early in 1960 asked the Virginia Department of Highways to consider a sheet aluminum bridge for one of its highway projects. The highway department agreed, and announced an aluminum triangular girder span as an alternate to a steel built-up plate girder bridge over the Appomattox River.

Sanford Construction Co., of Sanford, N. C., won the contract with a low bid of $88,771 for aluminum. The low bid for steel was $93,990, also submitted by Sanford. A spokesman for Reynolds said that his company had absorbed certain costs of the Petersburg bridge, such as the production of extrusion dies, because this was the first bridge of its type. The company predicted that subsequent sheet aluminum bridges would be cheaper to produce.

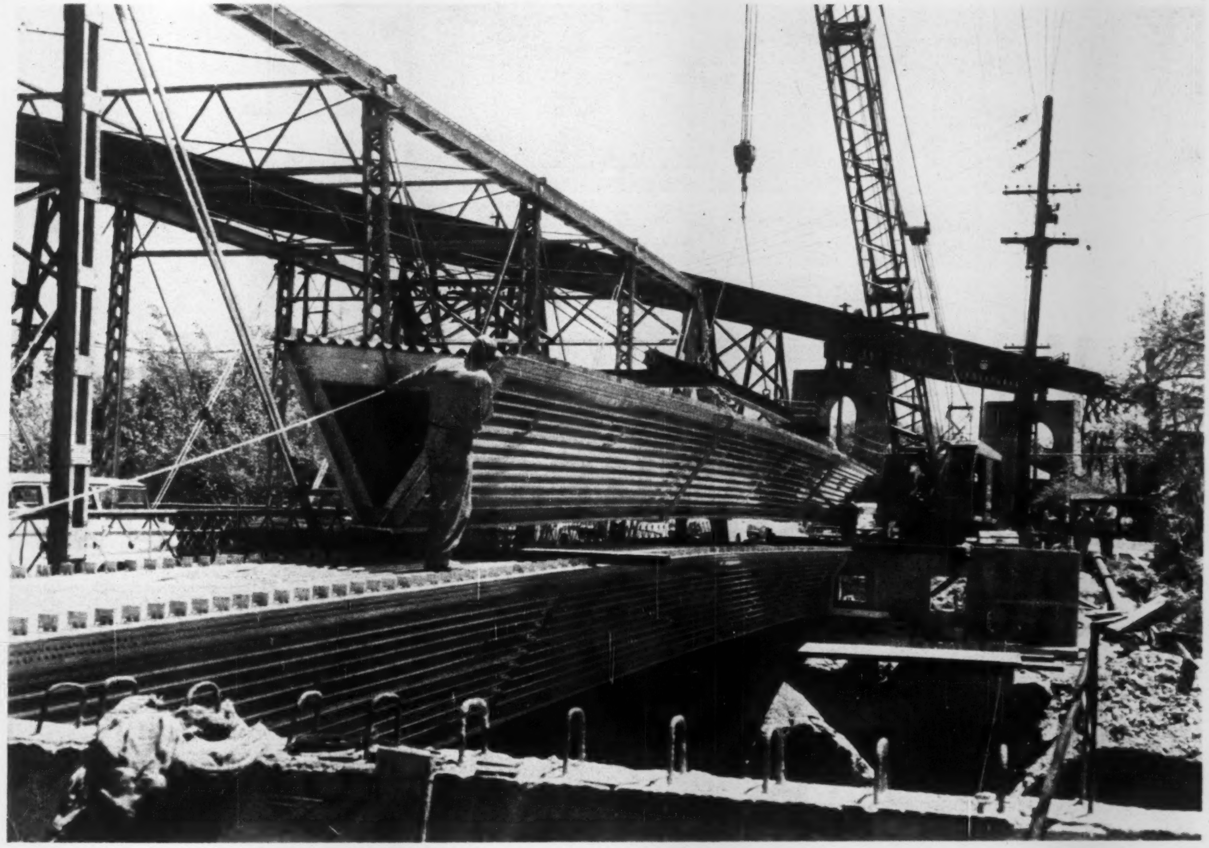
Lars Bergenhem, a product development engineer at Reynolds, has been coordinator for the Petersburg bridge project.

The triangular aluminum girders (the Reynolds designers call them modules) that make up the Petersburg bridge are 97 ft long, 4 ft 10 in. high, and 6 ft 9½ in. wide at the top. Erection meant simply placing them side by side, apexes downward, on prepared abutments. The contractor bolted the girder edges together at the top and connected the apexes, at the bottom, with channel bolts placed at 10-ft intervals.

So far, only three of the aluminum girders are in place. The fabricator delivered them one at a time in three consecutive days. A crane lifted each beam directly from the truck to its final position on the abutments. By prior agreement, the bridge will consist initially of only three of the planned five girders. Demolition of an adjacent truss highway bridge is part of the Sanford contract. When that bridge is gone, Sanford will install the last two aluminum girders to complete the new bridge.

Sanford Construction placed an 8-in concrete deck slab directly on top of the aluminum girders. Shear connectors bolted to the girders make the aluminum and the concrete a composite structure. Special steel shear connectors at both ends of the girders absorb thermal stress.

The weight of a single aluminum girder is 9,000 lb and the total weight of the entire aluminum bridge is 48,-



Girders will replace bridge at left. Square holes in abutment are for utility lines.

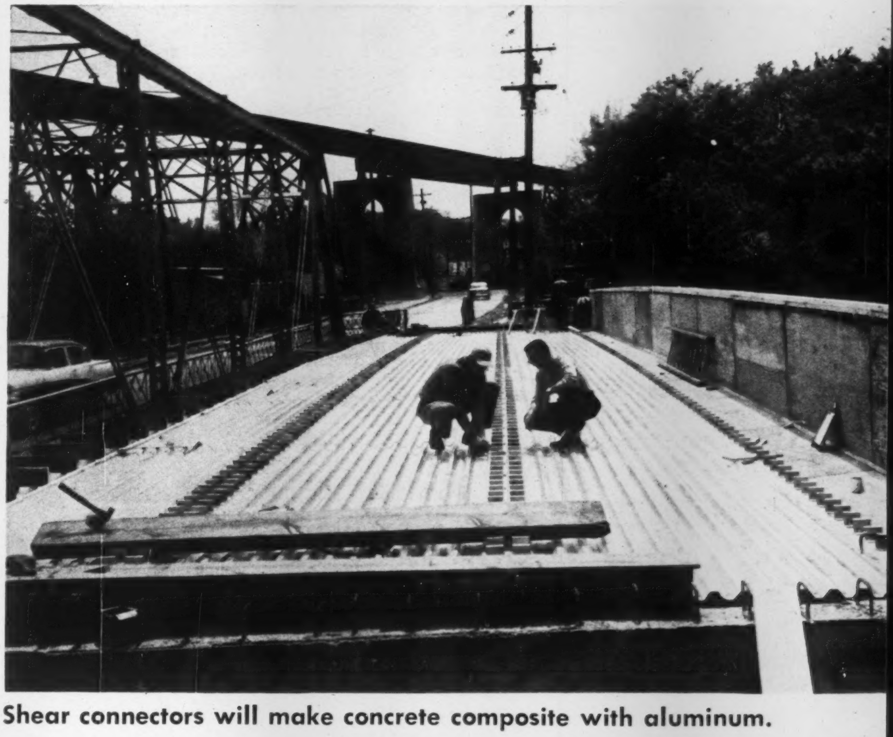
Appomattox

000 lb. The weight of the alternative steel bridge would have been 187,000 lb.

Globe Iron Construction Company, of Norfolk, Va., fabricated the bridge from aluminum furnished by Reynolds' standard production lines. About 65% of the aluminum is in the form of extrusions and the remainder is sheet, 0.1 in. thick. All of it is 6061-T6 alloy.

The aluminum sheet on the two sides of the girders is braced on the inside by vertical extrusions and on the outside by horizontal extrusions. The tops are of corrugated aluminum sheet, which serves primarily as a support for the concrete deck. The bridge will carry utility lines between the girders.

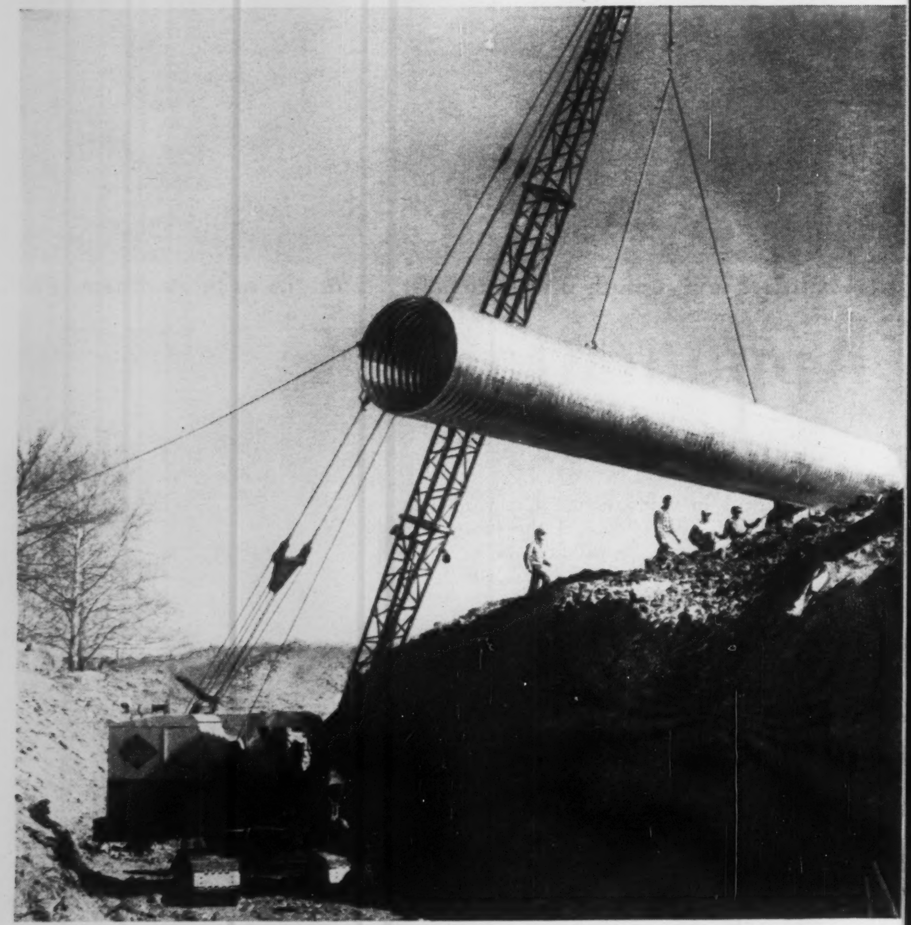
Runners-up in the race to be the first sheet aluminum bridge on the road are two highway overpasses in Amityville, N. Y. (ENR Jan. 21, 1960, p. 38) and a 300-ft bridge over the Patapsco River near Sykesville, Md. (ENR May 4, p. 24).



Shear connectors will make concrete composite with aluminum.

New steels are
born at
Armco

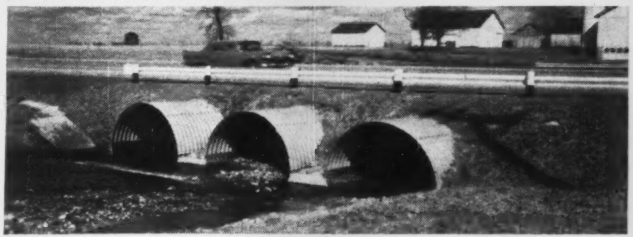
WHY ARMCO MULTI-PLATE GETS THE BIG JOBS ON



This forty-six-foot long section of Armco MULTI-PLATE Pipe was bolted together before being placed in the trench. Large sub-assemblies like this were used to construct the complete 1300-foot structure.

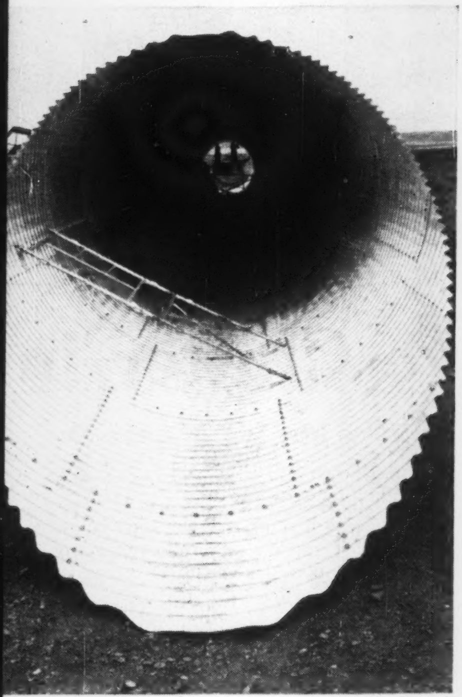
RIGHT: This 220-foot MULTI-PLATE Pipe will serve under Interstate 15, Montana. Workmen silhouetted at end of pipe indicate size.

Stream near the Donner Pass in California is carried under Interstate 80 by Armco MULTI-PLATE Pipe.



Battery of three Armco MULTI-PLATE Pipe-Arches on Interstate 75, Ohio.

THE INTERSTATE SYSTEM



Wherever you see Interstate Highway construction, odds are good that you'll find the big drainage jobs going to Armco MULTI-PLATE®.

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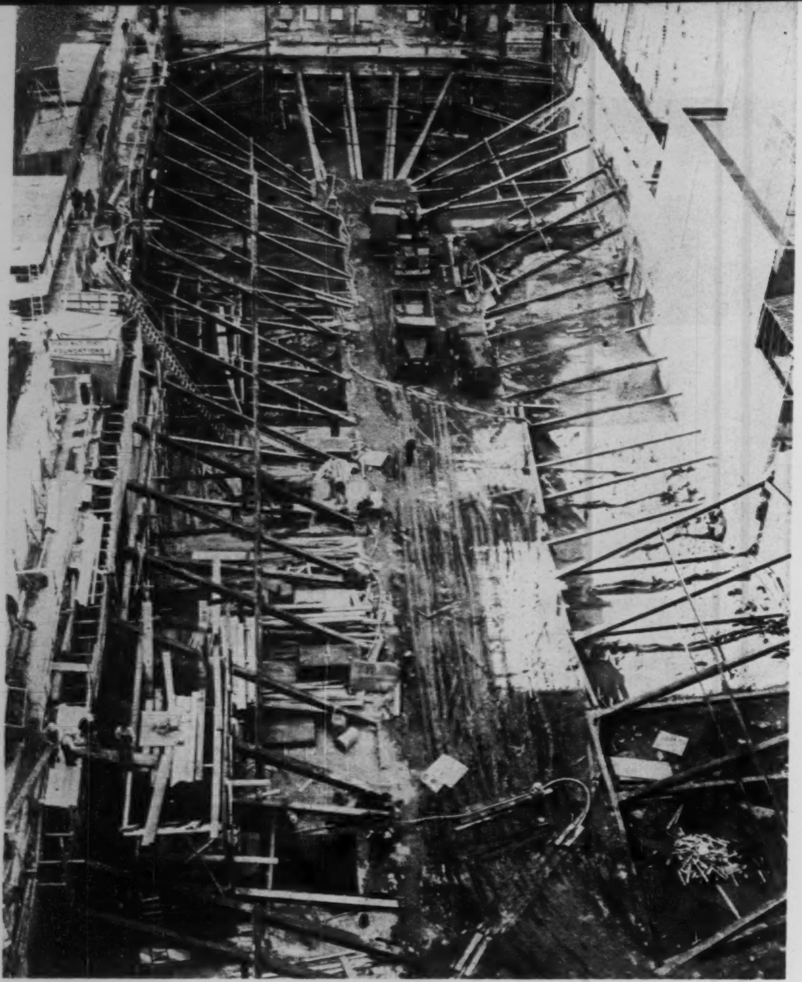
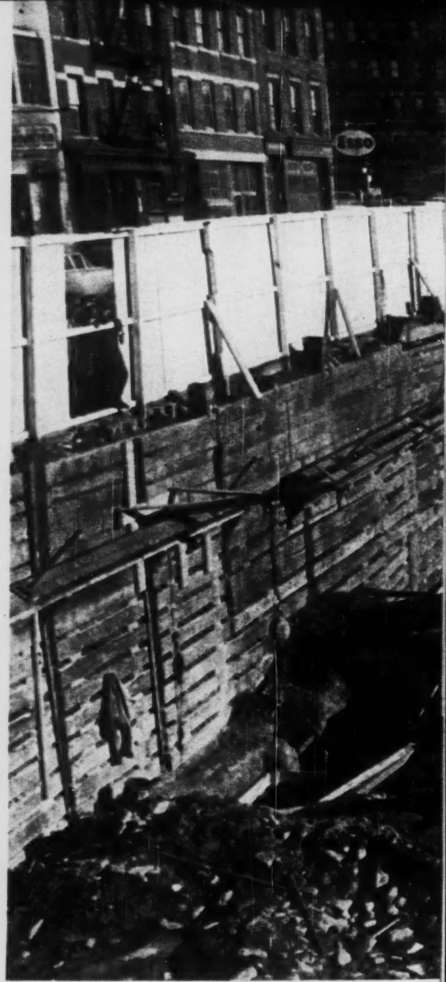


OLD: Inclined bracing makes excavated site an obstacle course.



NEW: Prestressed tiebacks, replacing rakers,

Tiebacks Remove Clutter in

A new system of prestressed tiebacks anchored into rock can save contractors the expense and lost time of cramped quarters in a building excavation cluttered with conventional inclined braces.

The tiebacks replace rakers that support wales spanning horizontally across soldier beams or interlocking sheetpiling. Post-tensioning pretests the tiebacks, thus insuring their safety.

The originators of the system, Spencer, White & Prentis, Inc., foundation contractor of New York City, has used tiebacks on four buildings, one in Milwaukee, one in Rochester, and two in New York City. Robert E. White, executive vice president, credits the late M. Andre Coyne, the French dam engineer, with pioneering in the use of prestressed rock anchors. Spencer, White & Prentis has applied for a patent on the tieback system.

Among the economies and conveniences Mr. White claims for the system:

- More extensive use of mechanical excavating equipment. Power shovels, large front-end loaders and backhoes replace less efficient crane-operated clamshells and hand shovels, commonly used to remove muck from beneath conventional shores. Track drills, unhindered by rakers, can put down blast holes in rock at a fraction of the cost of manually operated pneumatic drills.
- Increased safety, resulting from removal of key bracing members from danger of damage by blasting or moving equipment.
- Reduction of concrete forming and placing costs, particularly for walls and slabs where special openings must be formed around the rakers.
- Similar savings in placing blasting mats, reinforcing steel, structural steel, waterproofing, and other operations, taking place in areas cluttered with conventional bracing.

These savings in direct costs and time far outweigh the 20 to 30% greater cost per sq ft of sheeting braced with tiebacks over a conventional raker system, according to Mr. White.

At the New York Telephone Co. building in midtown Manhattan, Spencer, White & Prentis drove 106 soldier beams, spaced 7 ft c-c. Deepest subgrade on this job is about 40 ft below sidewalk elevation, typically requiring three rows of wales vertically spaced at 12 ft c-c.

The tiebacks for this building are either high-strength bars of 145,000-psi ultimate strength or seven-wire strands of 260,000-psi ultimate strength for greater design loads.

After a steam-powered pile rig drives the 14BP soldier beam sections to rock, power shovels and laborers excavate to a level 1 ft below the top wale. Workmen place horizontally spanning wood sheeting (lagging) behind the soldier beam flanges. Welders then connect brackets designed for a 45-deg bearing seat for the double-beam wales. After the wales come the tiebacks. Then, the same procedure is repeated for the second line of wales and a third line, if necessary.

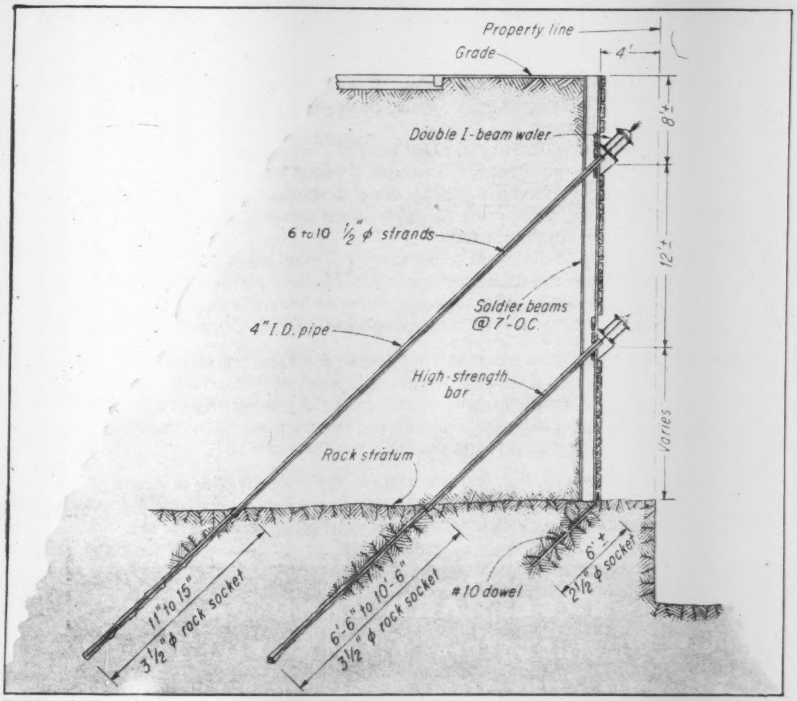
open the site for full use of power shovels and other mechanical excavating equipment.

Excavation

• **Installing the tiebacks**—A small crawler-mounted rig driving a pipe casing starts the installation of the tiebacks. The 4-in.-dia pipe goes in at a 45-deg angle until it reaches the rock stratum. Then a pneumatically driven "drifter" mounted on the same machine drills a 3½-in.-dia rock socket from 6½ to 15-ft depth, depending on the design load. Laborers clean out the hole with an air or water jet, and it is ready for the tendon.

Grout for anchoring the tendons in the rock sockets consists of high-early strength cement mixed in a high-speed rotating drum, which thoroughly separates the fine cement grains. This insures complete hydration of the cement particles and a fluid mix, despite a low water-cement ratio. The fluid grout is easily pumped into the socket. It is allowed to set three days, at which time it has attained 4,000 psi.

Next step is prestressing. To pretest the tiebacks, hydraulic jacks stress the tendons 25% higher than working


Property line
Grade
4'
8'±
Double I-beam waler
12'±
6 to 10 ½" ϕ strands
Soldier beams @ 7'-O.C.
4" I.D. pipe
High-strength bar
Varies
Rock stratum
#10 dowel
6'±
2½" ϕ socket
11" to 15"
3½" ϕ rock socket
6'-6" to 10'-6"
3½" ϕ rock socket

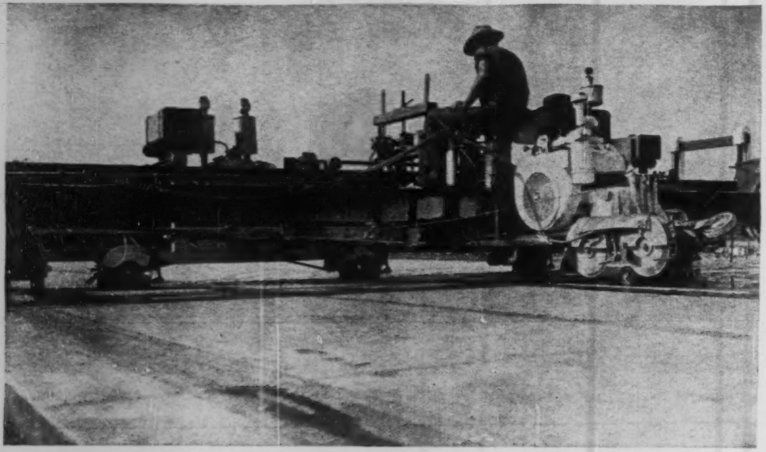
TIEBACKS are post-tensioned to pretest force 25% over working load.

DIAMOND BLADE SAWING OF CONCRETE

Case Report: PENNSYLVANIA Hwy.

COST-$.073 per linear foot

TYPE OF WORK—Pennsylvania Highway
AGGREGATE—Slag aggregate
SAWING OPERATION—Center line only was sawed—all sawing done with diamond blades.
DIMENSIONS—Longitudinal 3" x 3/16".



The case history cited above is typical of diamond blade sawing on concrete highway and runway projects. The cost-per-linear-foot figure is all-inclusive, accounting for labor, equipment, diamond saws, overhead and profit.

Diamond blade sawing makes possible significant reductions in time and labor costs. Precisely controlled joints are cut by high-speed, semi-automatic procedure—maintaining maximum concrete strength and homogeneity in the joint areas—without interfering with or delaying the actual paving operation.

The economy of diamond blade sawing is even more interesting and impressive to the maintenance engineer. He has learned that *sawing is producing the only joint that has proved reduction in maintenance costs.* Further, these savings are running as high as 50%!

Modern diamond blade sawing results are a matter of record
based on performance in many states.
For detailed information and field-use reports
from state highway officials and contractors, write to
Engelhard Hanovia, Inc., for Report #101.

Engelhard Hanovia, Inc. is the leading supplier of SND-MB diamond abrasive, a result of research that has greatly increased diamond cutting efficiency, to diamond blade manufacturers

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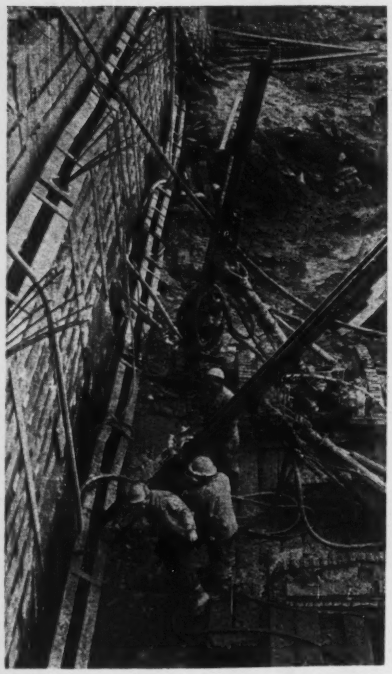
113 ASTOR STREET • NEWARK 2, NEW JERSEY



TRACK DRILL drives casing and drills hole for grouted anchorage.

stress, set at 50% of ultimate strength. The overstress is maintained for 10 minutes.

After release of the overstress an auxiliary ram in the jack forces an anchorage cone in place, leaving the tendon with its working stress.

A final step may involve the anchoring of the bases of soldier beams where they extend more than a few ft below the bottom wale. The crawler rigs drill 2½-in.-dia sockets 6 ft into the rock at the toe of the soldier beam. Laborers grout dowels into the socket, and a welder connects them to the soldier beam.

• **Fighting groundwater**—The best way to fight groundwater is to surrender gracefully, according to Mr. White. If water seeps into a hole, Mr. White says, the field crews merely wait until the inflow ceases. They wash out the mud and drill cuttings by flushing water through the grout pipe until the effluent becomes clear.

Grout that has been tremied into place in the static water is not subject to dilution and weakening from groundwater seeping in.

Architects for the New York Telephone Co. building are Voorhees, Walker, Smith, Smith & Haines; consulting foundation engineers are Moran, Proctor, Mueser & Rutledge. General contractor is Walsh Construction Co. Subcontractors on the foundation work were Civetta Excavating, Inc., and Carver Concrete Corp. All are from New York City.

ALPHA

BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

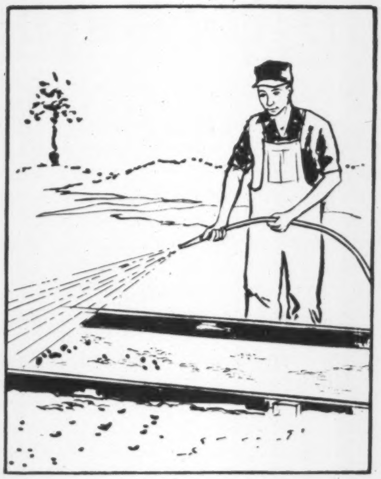
news and notes from the field

Simple Precautions Improve Hot Weather Concreting

When temperatures hover in the 80's and the humidity is low, it's time to make sure that certain hot weather concreting precautions are observed.

High temperatures accelerate the setting time of concrete and promote rapid evaporation of water. The result is "quick set" or premature hardening which may cause permanent strength damage. Tests have shown that concrete mixed at 100°F. requires about three more gallons of water per cubic yard to maintain the same consistency as concrete mixed at 73°F. You can see how this alone would reduce the strength of the concrete by increasing the water-cement ratio.

Preparations for Placing

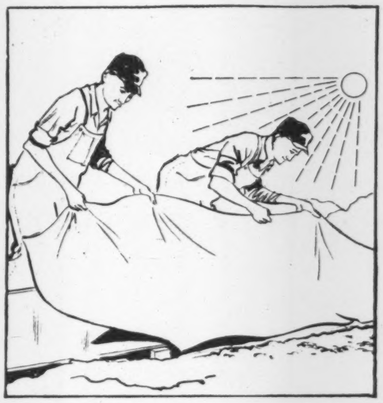


Thoroughly soak the subgrade the night before, and sprinkle it just before the concrete is placed so it will not absorb water from the concrete. The mix should be discharged as soon as it is delivered to the job site. Prolonged mixing should be avoided because of heat build-up inside the drum which raises the concrete temperature.

Ample help should be on hand ready to handle the concrete as soon as it is properly mixed.

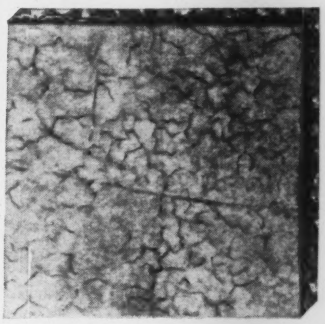
Avoid the use of strength accelerators in hot weather.

Finishing and Curing



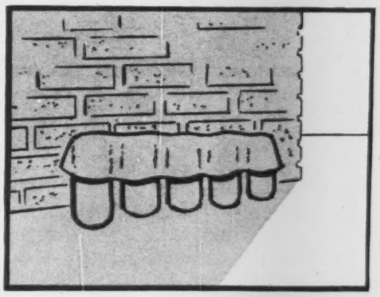
Under extreme conditions in hot weather it may be necessary to shade concrete or use wet coverings until final finishing can be completed.

To counteract the effect of hot, dry breezes, erect wind breaks or use fog nozzles on upwind side of fresh concrete. Start curing operations as soon as concrete has sufficient set to avoid surface damage. When curing is delayed, surface is apt to dry and shrink more rapidly than the lower portion of the concrete slab. This causes crazing or shrinkage cracks.



Crazing cracks. Surface shrinkage cracks result when the surface dries and shrinks more rapidly than the lower portion of the concrete slab.

Keep concrete damp during entire curing period, and cure for at least 7 days when durable surface and strength are important.



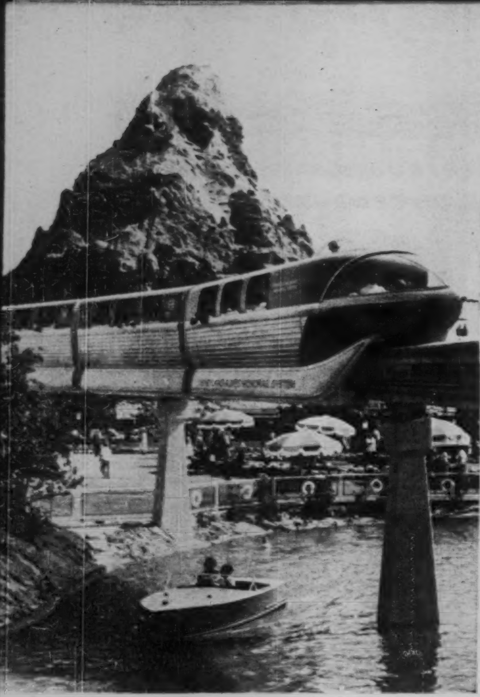
Concrete test cylinders should be kept shaded, damp and at 70°F. until they are ready to be sent to the laboratory.

If you would like additional copies of this information, ask your Alpha sales representative or write to Alpha Portland Cement Company, Easton, Pa.

ALPHA

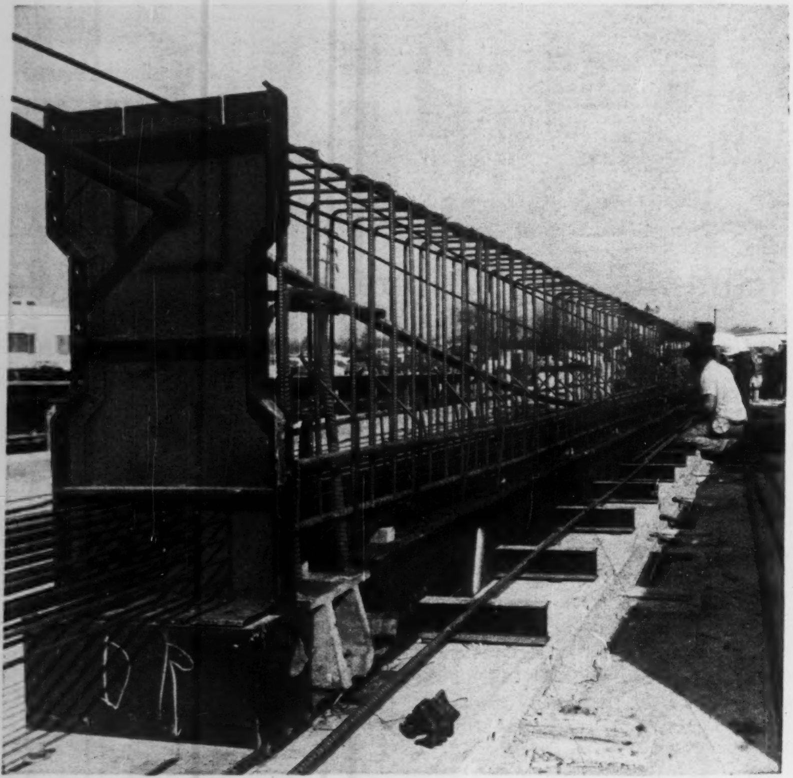
PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.



MONORAIL at Disneyland will travel to hotel outside park.

PRESTRESSING (right) will go into one-third of new monorail trackage.



Fun Monorail Grows Up to Rapid

Disneyland will extend its elevated monorail system to a length of 2½ miles this year, linking the park with nearby Disneyland Hotel. It will be the first monorail in the U. S. operating as a commercial transit line.

The amusement park's original monorail system, completed in 1959, has carried 4 million passengers over its three-quarters of a mile of twisting, undulating single track. Its trains logged 60,000 miles within the park. The important differences between this section and today's program are an increase of maximum speed from 20 mph to 45 mph and use of prestressed concrete girders for the track.

The outstanding similarity to construction of the 1959 section is the speed required. The contractor, J. B. Allen & Co., Santa Barbara, Calif., didn't get the job until Dec. 5, 1960, but the company has to finish it by June to capitalize on the summer season. Allen cast the first girder early in January and completed all the erection work by April. John B. Allen, principal owner of the company, had over-all charge of construction for the contractor who did the 1959 work.

On the park's first monorail system speed was limited to 20-mph, because of sharp curves in the track and the need to give the customers a long enough ride for their money. On the new section, long stretches of straightaway and carefully planned curves permit faster speeds.

Park officials say a monorail system of this type used in metropolitan rapid transit could go as fast as 80 mph. Alweg Corp., a German company headed by Swedish industrialist Axel Wenner-Gren, developed the system. The same company designed and is building a monorail line for the Century 21 Exposition in Seattle (ENR Mar. 23, p. 43).

Wheeler and Gray, of Los Angeles, are consulting structural engineers on the project.

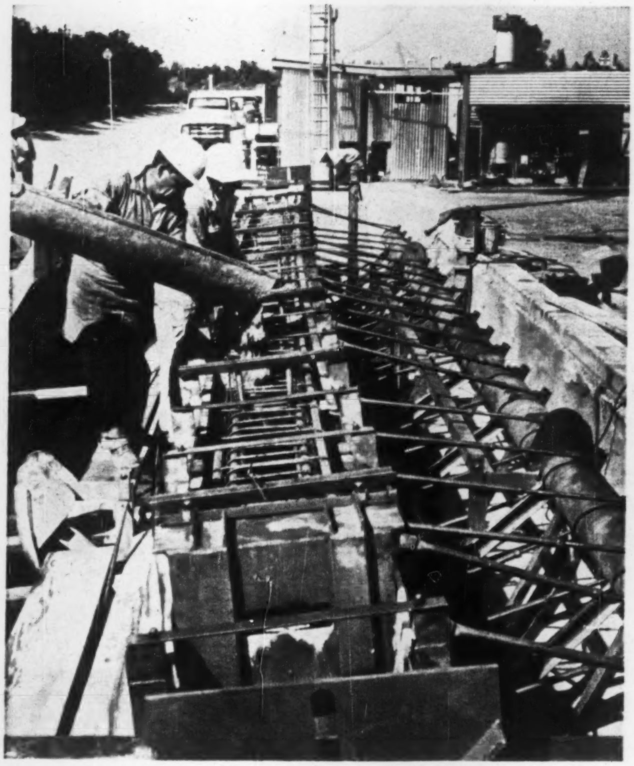
Trains in the Alweg system ride on an I-shaped, concrete elevated rail. The Bogies on which the trains ride include two pairs of wheels on top of the beam and four stabilizer wheels on each side. Designers say that the rail for this system must be of concrete. If the rail were steel, temperature changes (caused by the sun striking one side of a built-up steel girder of similar size) would warp it. A concrete rail is also easy to shape, requires little maintenance and makes less noise when trains pass over it.

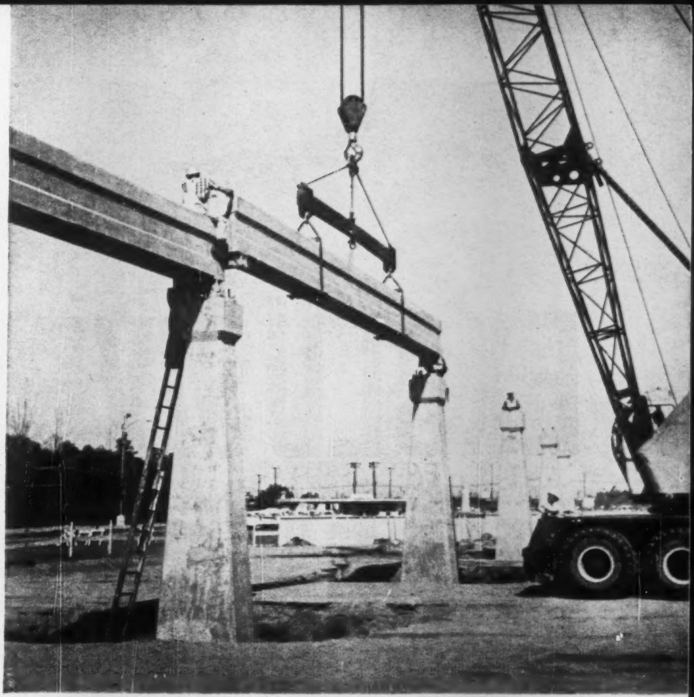
The park's original system had very few straight track sections, so the builders made no attempt to use prestressed concrete. But the $2-million extension, with its many long, straight stretches, is well suited for prestressed concrete and the builders have used this material for 50 girders on the job.

Because the trains are designed to two-thirds scale, the concrete rail is only 1 ft 8 in. wide (width of the Seattle rail is 3 ft). This width limits span length and also the number of prestressing tendons and reinforcing rods the builders can squeeze into a beam. As a result, the economical length of these girders proved to be 60 ft. A full-scale monorail would permit 100 ft spans.

The prestressed girders are both pretensioned and post-tensioned. Each one has 22 pretensioned strands of ⅜-in. dia., 20 near the bottom and two at the top. The top strands are there to eliminate cracking at the edge of the girder. These strands are tensioned to produce 246,400-lb residual working force. These girders also include a 1⅜-in.-dia rod fitted inside a metal tube and draped. Each of the rods imposes a residual working force of 142,000 lb.

Regular reinforced concrete girders will make up most of the length of the





CONCRETE PYLONS supporting girders stand on precision-built, heavily braced footings.

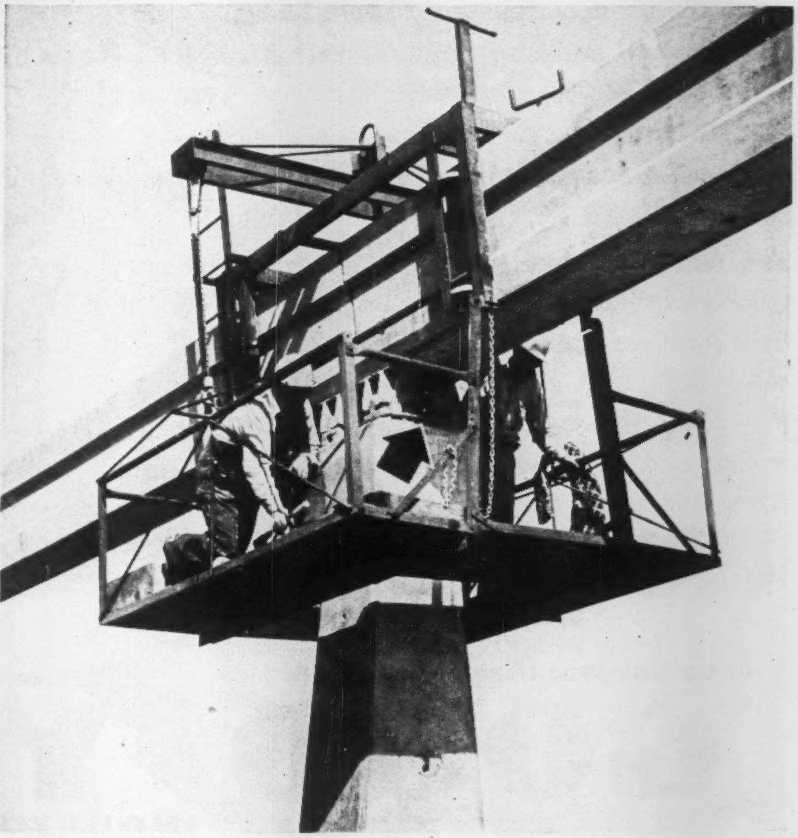
ADJUSTABLE FORMS (left) produce precise grade, curvature in reinforced concrete rails.

Transit

single track. The contractor produced 5,700 ft of them with forms used two years ago in construction of the original track. These forms are adjustable at 2-ft intervals, to produce curves in both horizontal and vertical planes. Accuracy of the girders is as important in developing a smooth ride as placement.

The girders that make up the single rail rest on concrete pylons that stand as high as 32 ft. Each pylon rests on a footing that includes 24-in.-dia poured-in-place friction piles that average 30 ft in depth. The contractor casts a reinforcing cage into the top 12 ft of the friction piles. These piles extend 3 in. up into a pile cap. A typical cap is 2 ft thick and 9½ ft square. With anchor bolts precisely placed and accurately cast pylons, little adjustment is needed in the rail girders. The erectors, however, carefully place and shim the girders into precise position with the aid of a hydraulic jack. The pylon-girder connections can be re-adjusted if settling or shifting occurs.

Joseph W. Fowler is vice president of Disneyland, Inc., in charge of all engineering, construction and maintenance. John C. Wise is chief engineer. Harry Hall was general superintendent for the contractor.



HYDRAULIC JACK (arrow) raises girder to permit insertion of adjusting shims.

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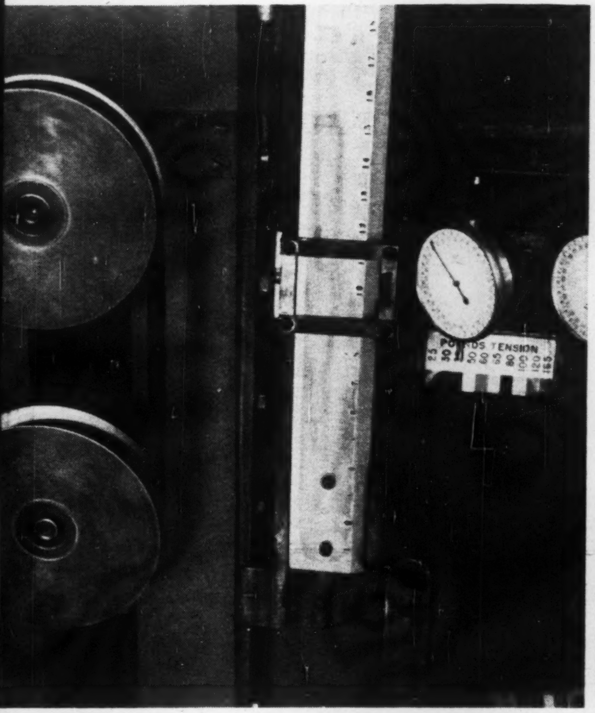
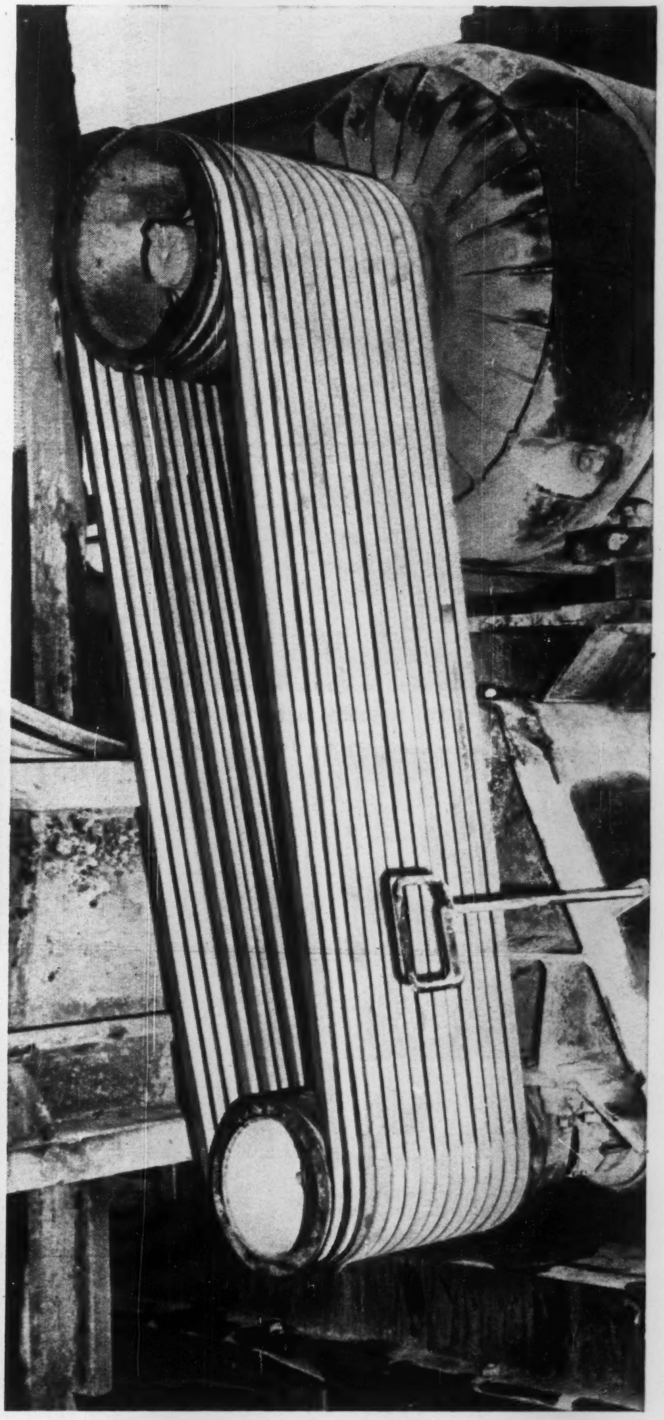
CODES TO 1/32"...



Length-coding GREEN SEAL V-Belts to 1/32" – not just 1/10" like most belts – takes this ultra-precision machine. *Only* Goodyear has this type of equipment, which is set by means of fine-tolerance steel templates to insure accuracy.



Harnessing this big, 22-saw stonecutter for 3 full years required COMPASS-V-Steel Belts by Goodyear. Over this period, the Goodyear belts helped carve up 20 tons of rock a day—over 15,000 tons in all. Normal V-belt life in this type of rugged service is a scant 6 months.

Film Strips

For a low-cost photographic record of streets and highways as drivers see them, Aero Service Corp of Philadelphia takes sequential pictures with a truck-mounted camera.

The resulting photographs show road and roadside conditions, including obstructions to driver vision, unsafe intersections, inadequate shoulders and confusing, insufficient or misplaced signs. The pictures can help determine maintenance or redesign needs, the desirability of installing, moving or removing traffic lights, the need for changes in channeling traffic or for eliminating encroachments.

And Aero Service also suggests that highway departments might find the visual record useful in improving relations with taxpayers and legislators.

To achieve the driver's eye view of the road, Aero Service mounts a specially adapted 16 mm camera in the front panel of a cab-over-engine truck. The camera is about the same height above

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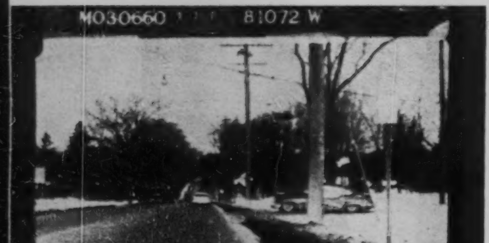
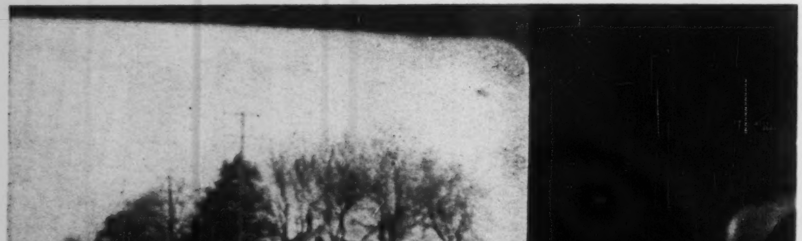
INC.
PHOTO/FILE
SURVEYS Inc.

Camera in vehicle is set to take pictures at 52.8 ft intervals.



SEQUENCE PICTURES (shown enlarged) appear as separate frames on 16 mm film.



FOR GROUP STUDY, images can be projected on a screen as conventional slides or in a timed sequence that shows how a road looks at travel speeds of up to 100 mph.

Show the Road Ahead

the pavement as the head of the driver of a conventional automobile, and it is set to take a single picture of the road ahead at every 52.8-ft interval. The pictures as developed are individual frames of a motion picture film. At the bottom of each photo frame there is a data box that contains a department code number, the data, odometer reading, route number and direction of travel.

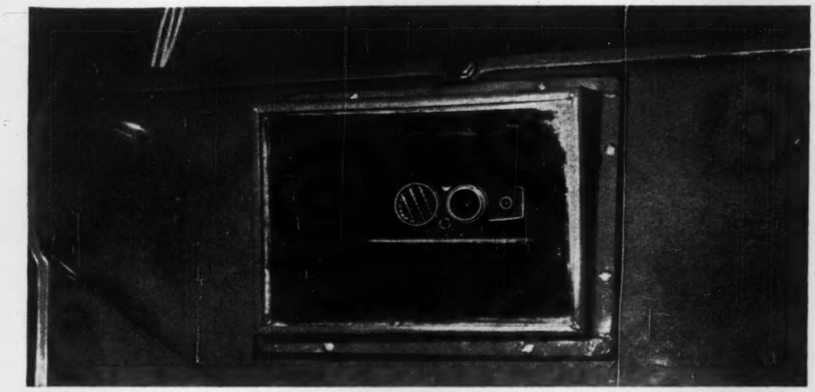
The pictures are usually made during daylight hours, but they can be taken at dawn or dusk or in rainy weather to reveal visibility conditions at these times. Black and white film is standard, but colored film can be used if required.

The negatives of the pictures can be made into enlarged positive prints for protracted study, or they can be studied through a viewer. They can also be used in slide projectors for displays to groups of people, and they can be run through a time and motion study projector to show what a driver sees while traveling at speeds of from 0 to 100 mph.

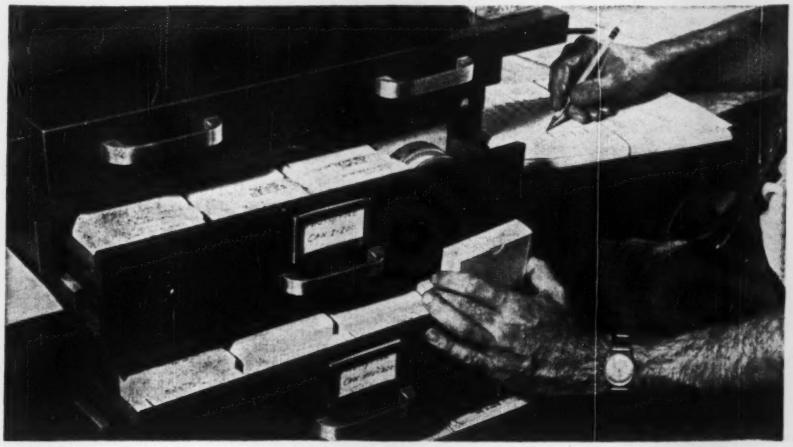
The cost of a Photo-File record averages about $15 per camera mile, but this figure will vary with the amount of mileage to be photographed and with the record requirements of the individual job.

Among the advantages claimed for Photo-File records are compactness and convenience. Aero Service says that 10,000 miles of road can be photographed on 500 rolls of film, and this film can be stored in about 10 cu ft of space.

Aero Service, the outfit that developed Sur-Fax, a technique for the continuous strip filming of pavement surfaces (ENR Sept 22, 1960, p. 158) claims that with Photo-File and Sur-Fax films, it is possible for highway engineers to view, at any time and at a moment's notice, all relevant highway conditions in any photographed area.



CLOSE-UP of camera shows lens and electronic eye for controlling exposure.



LITTLE STORAGE AREA is required for Photo-File films. Pictures of more than 10,000 miles of highway can be stored in less than 10 cu ft of space.

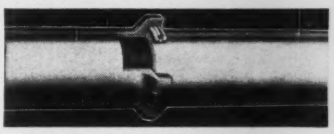
ROBINSON'S GOT ALL THREE NEW JOINTS IN

NEW CLAY PIPE

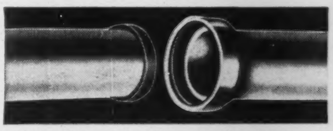
100-year guarantee available on request.

Newer, stronger, longer Robinson Clay Pipe has the joints to do *any* job *right*, do *any* job *faster!*

Wedge-Lock®... Tight, yet flexible to withstand frost heave, traffic vibration, heavy backfill.



Wedge-Lock® TYPE "O" . . . Tightest joint yet for large diameter pipe. Ideal in problem trenches, unstable soil.



Slip-Joint . . . Economical bituminous seal bonds quickly. Simple to install, allows immediate backfill.

Wedge-Lock and Wedge-Lock Type "O" conform to ASTM Designation C425, Type I and Type III.

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CLAY PRODUCT CO.
ESTABLISHED 1856
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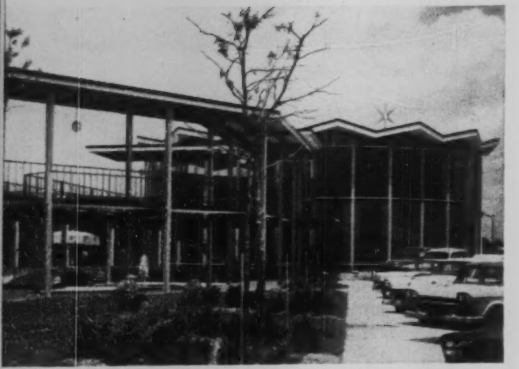
Architect: William Tamminga. *Consulting Structural Engineer:* Karl A. Krause. *Steel Fabricator:* Mosher Steel Company.
Steel Erector: Palmer Erection Company. Bethlehem supplied structural steel for this job.

for Strength
. . . Economy
. . . Versatility

Texas motor hotel completed in 8 months thanks to steel framing



Much of the steel frame is left exposed and painted black, or pastel blue with striking architectural effect.

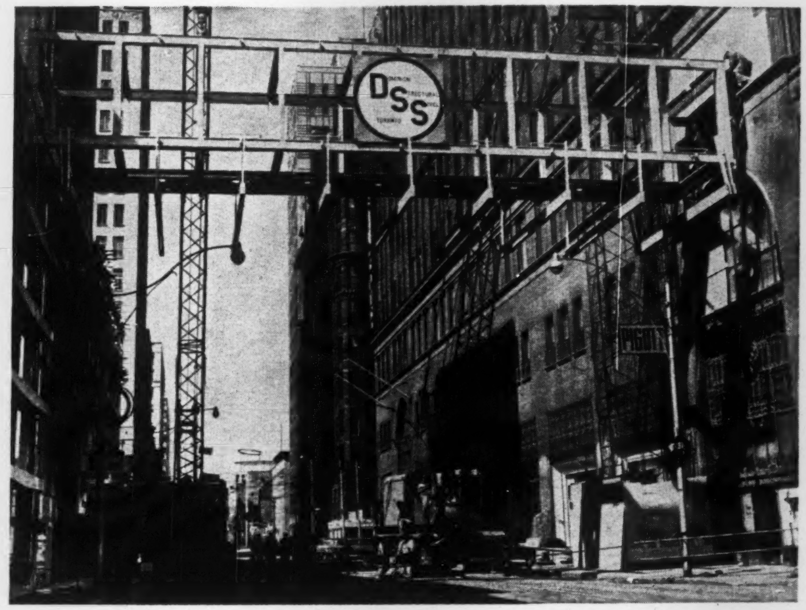
Eight months from the day they broke ground for the Carrousel Motor Hotel, near the International Airport in Houston, it opened for business . . . and the owner's investment started paying off.

A good deal of the credit for this remarkable speed record must be given to the architect's choice of steel framing for the 110 guest rooms, the large dining room, and the promenade. The steelwork not only went up fast, but also permitted all the other trades to move in quickly, and speed the motor hotel's completion.

Thanks also to the steel frame, the owner will be able to expand the hotel quickly and economically. A new steel frame can be tied in to the old one without having to put in another set of columns and losing floor area.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Cranes hoisting preassembled trusses make for . . .

Fast Work in Linking Buildings

Toronto's first pedestrian bridge was lifted into position in exactly 60 seconds. Two cranes held the 66-ft truss there for 15 minutes while workmen tied in the single span 37 ft above the street. Two days later, the bridge was enclosed and ready for use.

The finished "Sky-walk" joins Simpson's department store with a garage on the opposite side of Richmond St. Because heavy traffic had to pass freely and safely on Richmond St. during erection of the bridge, the general contractor, Pigott Construction Ltd., decided to preassemble the main structural frame—two steel Vierendeel trusses and cross bracing.

Dominion Structural Steel Co., fabricator of the framing, transported it to the site early on Sunday, April 23. Workmen attached scaffold hangers to the truss to facilitate later work, while cranes held the framing 6 ft above the street. Working together, the cranes then raised the trusses to the fifth floor level and held it while workmen tied them into the buildings.

With the bridge in position, scaffolding completed and deck pans set for concrete placement, Sunday's work schedule was completed.

Monday morning, as crowds rushed by under the scaffolding, the bridge deck was cast, the roof was sealed, and the store's masonry was replaced.

By Tuesday, aluminum-framed plate glass enclosed the bridge and flower boxes decorated it.

Japan Builds for 125-mph Trains

Japanese National Railways will begin construction this year of a rail line between Tokyo and Osaka that will provide the world's speediest train service.

Passenger trains will operate at speeds up to 125 mph and freight trains to 90 mph on the new $548-million line.

The line will link Tokyo with Osaka by way of Kyoto, Nagoya and Yokohama over 311 miles of track through the heavily industrialized Tokaido area. The existing highway in the area is overtaxed and the narrow-gage railway operates at capacity. Transportation facilities have failed in recent years to keep pace with industrial, agricultural and population growth.

The new railway will be electrically powered and of standard gage. Service is slated to begin early in 1964. An $80-million loan from the International Bank for Reconstruction and Development will help to finance construction. The rest of the money for the project will be borrowed in Japan by the National Railways.

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"Design Techniques for Controlling Moisture and Condensation in Building Structures" is a technical manual covering moisture movement, condensation problems and modern methods for controlling moisture and vapor movements. Provides factual data illustrating how the installation of a true vapor seal isolates the structure from the site and eliminates the common problems of excessive moisture . . . dampness, condensation, paint and insulation failures, efflorescense, etc. This manual was specifically produced to assist architects and engineers in protecting structures from moisture migration . . . used in many colleges and universities. Originally published for sale . . . now available free of charge through the courtesy of W. R. Meadows, Inc.

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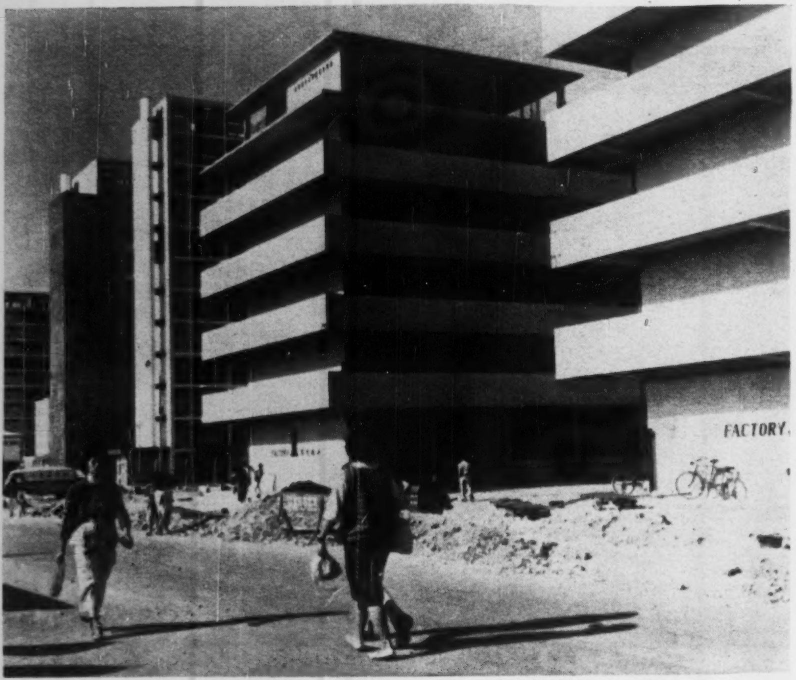
Watch Reynolds TV show: "HARRIGAN AND SON," Friday evenings, ABC-TV Network.



Novel Factories in Hong Kong

Low-cost housing developments in Hong Kong are being built with factories attached. The multi-story reinforced concrete buildings, divided into small manufacturing areas, are rising on the same site as the multi-story residence structures, and are designed and built by the same organization, the Hong Kong Housing Authority (ENR Dec. 22, 1960, p. 102).

Thousands of refugee Chinese, who started off with make-shift huts and no jobs, are being moved into these modern facilities to become substantial, producing citizens. They have given such a big lift to the goods—high in quality and low in price—that this British Crown Colony is able to export that a recent Japanese textile trade mission returned home with the warning that Japanese export markets were seriously threatened.

Quadros OK's Big Brazilian Dam

Brazil's President Janio Quadros has given the green light for construction of a $150-million, multipurpose hydroelectric plant on the Sao Francisco River near Sobradinho.

Present plans call for a concrete dam flanked by earth embankments. If constructed at the site now under study by the federal Sao Francisco Valley Commission, Sobradinho will produce 800,000 kw with eight Kaplan-type turbine generators.

Preliminary plans call for a 131-ft-high dam nearly four miles long. Over 9 million cu yd will go into the earth embankments while the concrete center section will contain over a million cu yd.

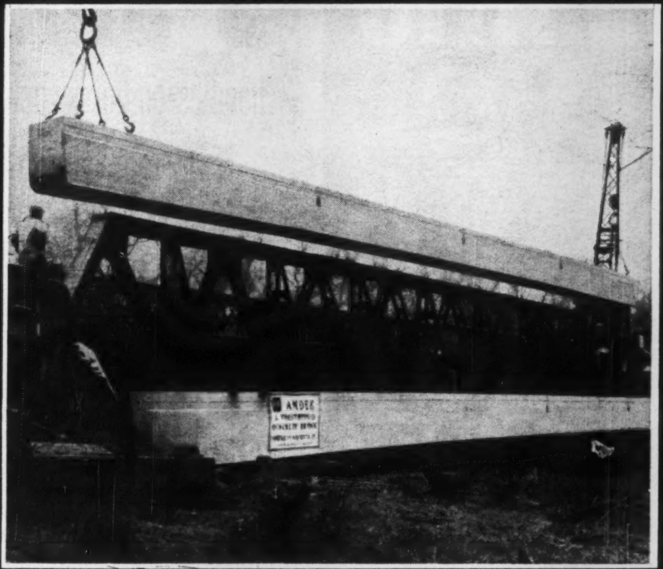
Power from the Sobradinho development, located about 400 miles west of Recife, will be used chiefly for irrigation and rural electrification. It will be marketed through a partly government owned company called Centrais Eletricas do Medio Sao Francisco. The new dam also will regulate flow along some 300 miles of river for navigational purposes.

Sobradinho Dam is the middle link in a regional power-irrigation-navigation control plan for the Sao Francisco. Besides the 520,000-kw Tres Marias Dam, which is located some 800 miles upstream, the system includes the Paulo Afonso Dam on the lower Sao Francisco that is now producing 380,000 kw. Paulo Afonso has an ultimate capacity of 900,000 kw.

The nearly complete Tres Marias development is scheduled to go into operation sometime next year (ENR Aug. 11, 1960, p. 42).

time is money ■ Incor saves you time ■

Elkhart River Bridge on U. S. 6. Owner: State of Indiana. Contractor: Butler & Butler, Spencerville, Ind. Precast, prestressed slabs: American-Marietta Company, Concrete Products Division, Lafayette, Ind.



bridge replaced in 12 hours with prestressed concrete box slabs

When the old steel bridge on U. S. 6 near Ligonier, Indiana, had to be replaced recently, precast, prestressed concrete construction provided a neat solution to the knotty problem.

After considering the cost of a temporary runaround in this location ($24,000), or the expense of prolonged detouring ($1,000-$2,000 an hour in time and extra costs to truckers), the Highway Department decided to bypass old-style methods entirely. Precast, prestressed 100-ft. box slabs made with Incor 24-hour cement were brought to the job site and held ready for placement the moment the old members were out. A scant twelve hours after the old bridge was removed from service, traffic was rolling smoothly across the new one. Things have a way of rolling smoothly when Incor is put to work. It makes maximum use of men, machinery and forms . . . lets you plan with new freedom. Standardize on Incor and watch "tight spots" disappear.

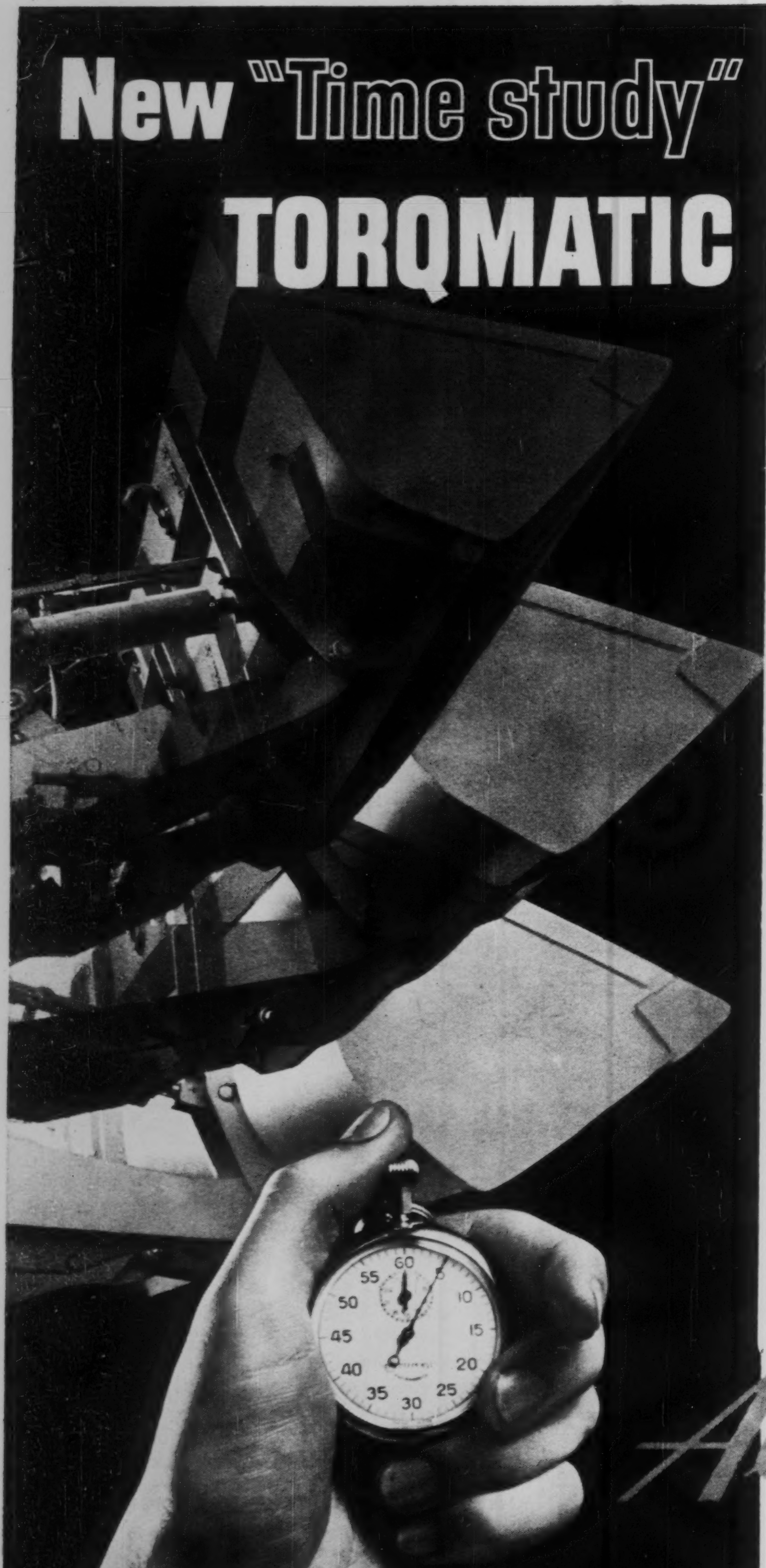
AMERICA'S FIRST HIGH EARLY STRENGTH CEMENT

INCOR®

LONE STAR CEMENT CORPORATION

LONE STAR CEMENT CORPORATION, NEW YORK 17, N. Y.

New "Time study" TORQMATIC 3-SPEED



handles bigger loader power—speeds bigger loader jobs

Here's the new, more powerful hydraulic transmission loaders have long needed—the CRT-3531 "Time-Study" TORQMATIC 3-Speed.

Built for bigger jobs, it can handle 350 ft.-lbs. of engine torque . . . features a special high-efficiency, three-element torque converter with a stall torque ratio of 3.7 to 1 . . . provides total torque multiplication of 29.6.

And, because it has only 3 speeds instead of 4, it cuts the shifts operators must make—naturally the three-speed loaders crowd, dig, load and travel faster.

What's more, like the time-proved CRT-3331 "Time-Study" TORQMATIC, *it's designed to need no major service for two-engine overhauls.*

The reasons are clear: Integrated converter-transmission eliminates troublesome hoses . . . planetary (not countershaft) gearing splits tooth load three ways . . . clutches are up to twice the diameter of those used in other hydraulic transmissions.

Want the full story? Write Allison today.

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Indianapolis 6, Indiana
In Canada: General Motors Diesel Ltd., London, Ontario

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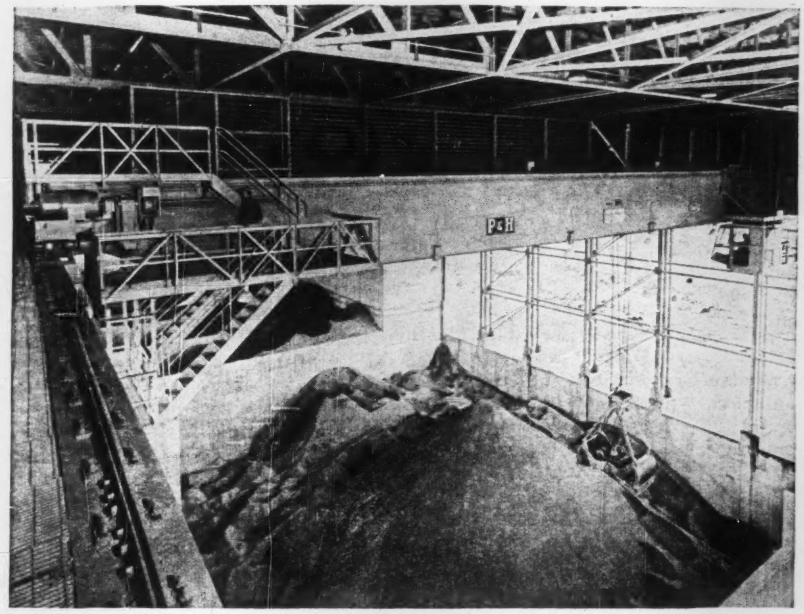
TORQMATIC® DRIVES

THE MODERN DRIVE FOR MODERN LOADERS

New Products



OUTSIDE it's an overhead crane, powered by motors at corners of the box girder.

Crane 'Tunnel' Protects Controls

Here's the inside story of a new type of overhead crane:

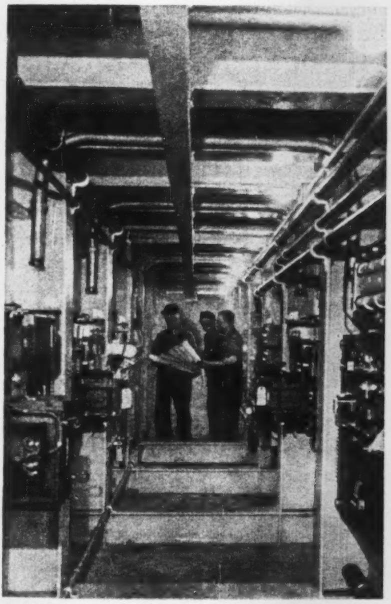
An 8 x 5-ft passage, running almost the full 120-ft length of the girders houses electric controls. This hollow beam is pressurized at about 2 psi above atmospheric pressure to prevent seepage inward and to help cool the components inside.

Maintenance personnel working in the overhead passage need not worry about falling to the floor below. Nor is there any danger of getting tied up in mechanical linkage of a power shaft, because there is no centralized motor. The crane is powered across the plant roof, on beam tracks, but four small motors located at corners of the beam.

All eight motors of the crane and its grab-bucket are under a "steepless" control that gives minute increments of speed and power. The number of control levers in the cab has been reduced from four to two. Grab-bucket and hoist are dc powered; all else is on ac power.

Another safety feature of the crane is the system for placing heavy equipment inside the box girder. An I-beam track running the full length of the ceiling inside the girder houses a heavy capacity traveling hoist. This electric hoist lifts tools and equipment from the plant floor, brings them through a dust-proof hatch on the floor of the box girder, then spots them at any point inside the girder.

Total material handling power for the crane shown above is 540 tons per hour. Endurance tests proved the crane is capable of one 15 ton lift every 53 seconds for 36 hours. Capacity for individual lifts is 15 tons, including five-ton bucket. HARNISCHFEGER CORP., 4444 W. NATIONAL AVE., MILWAUKEE 46, WIS.



INSIDE it's a pressurized control room.

STOW
TAMPER TAMPS
4500 SQ. FT.
PER HOUR

STOW

The Stow T-18A Tamper packs a profit punch . . . combines vibration with impact to work faster, more efficiently. Compacts granular soil in trenching, backfill, sub-bases, foundations—even black-topping and pavement patching! Here's why:

- **WALLOP:** engineered to coordinate engine and vibrator strokes for a 2200 lb. impact—2400 times a minute!
- **SPEED:** self-propelled at up to 50 ft. per minute — 4500 sq. ft. per hour!
- **TROUBLE-FREE:** easy-starting Wisconsin engine has fuel pump that operates at any angle!
- **RUGGED DESIGN:** heavy-duty components, plus gas tank mounting under the engine for less wear and tear!

Contact your Stow distributor for an on-the-job demonstration, or mail this coupon for Tamper Bulletin #610-10

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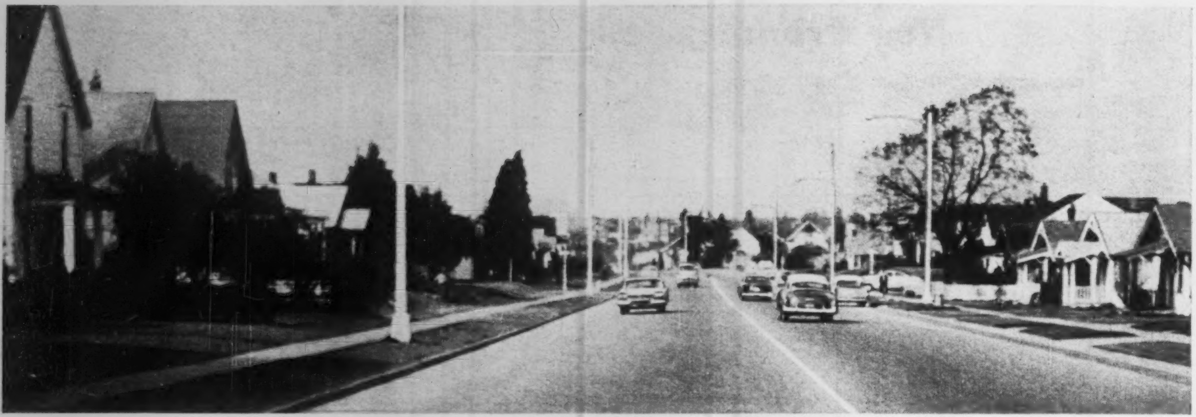


Seal Coating with Cationic Bitumuls produced uniformly fine results in spite of early showers

CATIONIC BITUMULS SPEEDS SEAL COATING IN TACOMA

The City of Tacoma, Washington, has two major sources of street maintenance problems. First, some forty miles of very old (1890-1915) sheet asphalt surfaces. These are now badly cracked and extensively patched. Second, several hundred miles of streets that have only a light bituminous treatment. The ever-increasing traffic load is starting to cause trouble on these.

In the past, the City has settled for continuous patching on the sheet asphalt; and Seal Coating of the light bituminous arterials, using either anionic emulsions or cutbacks. The Seal Coating required closing the streets to traffic for long periods; and weather was a constant threat, restricting the work seasonally.

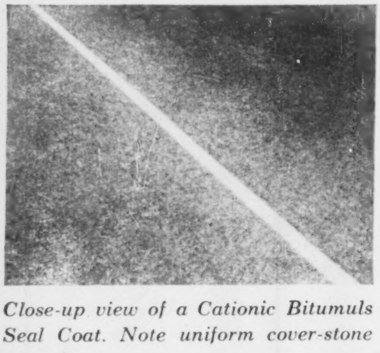
City maintenance forces were quick to see two major advantages of Cationic Bitumuls when it was first introduced. A—This material had a natural affinity for the cover aggregate being used. B—The rapid-setting characteristics sharply reduced the danger of "wash-off" from rain. (When showers actually occurred within two hours of job completion, there was no damage!)

Based on earlier work the City was able to "field" a well-integrated Seal Coating team. Cationic Bitumuls sets rapidly so that Seal Coating operations were co-ordinated even more closely. Both the cover-stone truck and the pneumatic roller could follow very closely behind the distributor!

The Seal Coating operation has now been extended to the "ancient" sheet asphalt pavements. Here it prevents the break-up action that made earlier patching necessary.

Using Cationic Bitumuls, streets are closed to traffic a much shorter time; and the work season begins much earlier in the year.

Discover for yourself the ability of Cationic Bitumuls to extend the work season; and to coat and hold most aggregates—even those normally regarded as "difficult". Bitumuls Engineers in our nearest office will supply full information; and will arrange for you to see a Cationic Bitumuls job in your area.



Close-up view of a Cationic Bitumuls Seal Coat. Note uniform cover-stone retention

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Mobile, Ala.
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Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

BITUMULS® Emulsified Asphalts • CHEVRON® Paving Asphalts • LAYKOLD® Asphalt Specialties • PETROLASTIC® Industrial Asphalts

Men and Jobs

Engineering Dean Retires After 31 Years Service

Brother Amandus Leo, for 31 years dean of Manhattan College's school of engineering, will retire at the end of the present term. He will be succeeded by the present head of the electrical engineering department, Robert T. Weil.

Although he is retiring as dean, Brother Leo has just been reelected president of the Association of Engineering Colleges of New York State. He will continue at Manhattan College as a faculty member in the department of mathematics.

Brother Leo is a member of the Mayor's Advisory Planning Board for the Bronx and the Mayor's Committee on Professional, Technical and Managerial Manpower in New York City. He is also chairman of the engineering scholarship committee of the New York State Society of Professional Engineers and a member of the committee on teaching aids of the American Road Builders Association.

The new dean, Mr. Weil, has been a faculty member at Manhattan for 29 years. He has been head of the electrical engineering department since 1945

Photogrammetrists Elect Wickham and Wright

Two new officials have been appointed to direct the Association of Professional Photogrammetrists (AoPP).

John H. Wickham, Jr., becomes executive director, succeeding Col. John G. Ladd, recently retired. Mr. Wickham has been associated with government and military mapping agencies, and with photogrammetric engineering companies for the past 23 years.

The new chairman of the executive committee will be Marshall S. Wright, Jr., who succeeds A. O. Quinn, chief engineer, Aero Service Corp., Philadelphia. Mr. Wright is manager of the Washington, D. C. office of Lockwood, Kessler & Bartlett, consulting engineers, Syosset, N. Y.

Business

John P. Buscher, former Washington representative of the Standard Oil Co., has been named manager of the Washington, D. C., office of Brown & Root, Inc., Houston, engineering and construction company.

Myles C. McGough, executive vice president of Merritt-Chapman & Scott Corp. in charge of the construction and marine department, has been elected to the company's board of directors. He has been with the company 25 years.

Samuel G. Richardson, since 1959 manager of engineering reports for the Austin Co.'s 14-state Cleveland district, has been appointed general manager of Austin-Anderson, Ltd., a newly formed Australian company jointly owned by Austin and A. J. Anderson Pty. Ltd., of North Sydney, Australia.

Robert S. Calkins, Lincoln, Neb., civil engineer has established a consulting engineering service to deal with water resource, municipal, hydraulic, soils and erosion control engineering. Former public health engineer for Nebraska, Mr. Calkins has spent 21 years with the Soil Conservation Service.

Ernest Bakie and **Richard Cates** have formed an architectural association, Bakie-Cates & Associates, at 9415 Montgomery Rd., Cincinnati. Mr. Bakie has practiced under his own name for the past three years; Mr. Cates formerly was with Potter, Tyler, Martin & Roth in Cincinnati.

H. Neil Warren and **Thomas Siebert,** consulting engineers, have brought into the association **Thomas D. Wosser,** a structural engineer formerly with Gould and Degenkolb. The new firm will be called Warren, Siebert & Wosser, consulting engineers, with offices in Palo Alto, Calif.

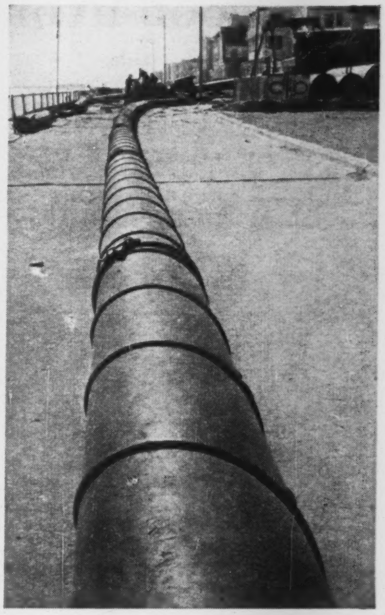
Retired **Brig. Gen. Clarence Renshaw,** former Director of Military Construction in the Office of the Chief of Engineers, has been appointed a vice president of Frederic R. Harris, Inc., international consulting firm with headquarters in New York City. During World War II General Renshaw headed the design and construction of the Pentagon.

Roy Jorgenson, former engineering counsel for the National Highway Users Conference, has formed a highway management consulting firm at 3709 Chevy Chase Lake Drive, Washington 15, D. C. He is also a past chief engineer of the Connecticut State Highway Department.

Robert Potter has been elected president of Lockwood Greene Engineers, Inc. Except for World War II service in the Navy, he has been with the Boston-based designers of industrial plants since 1939. Former president **William J. Heiser** has moved up to chairman of the board of directors.

The Perini Corp. of Framingham, Mass., has named **C. S. Davis** executive vice president for foreign operations. He will head the foreign work of the parent company, Perini Ltd., and Perini Quebec Inc., and be managing director of Perini International A. G.

SHORT CUT TO LONG LINES



Save Work and Speed the Job with NAYLOR Pipe and Wedgelock Couplings

For air, water and ventilating lines, you'll save time and money with this NAYLOR combination.

NAYLOR pipe is light in weight, easy to handle and install. Its lock-seamed, spiralwelded structure assures extra strength and safety.

WEDGELOCK couplings provide a positive connection securely anchored in standard weight grooved ends. Speed the job. A hammer is the only tool required to connect or disconnect them. Available in low-pressure and heavy-duty types.

Write for Bulletin No. 59 on pipe, fittings and couplings.

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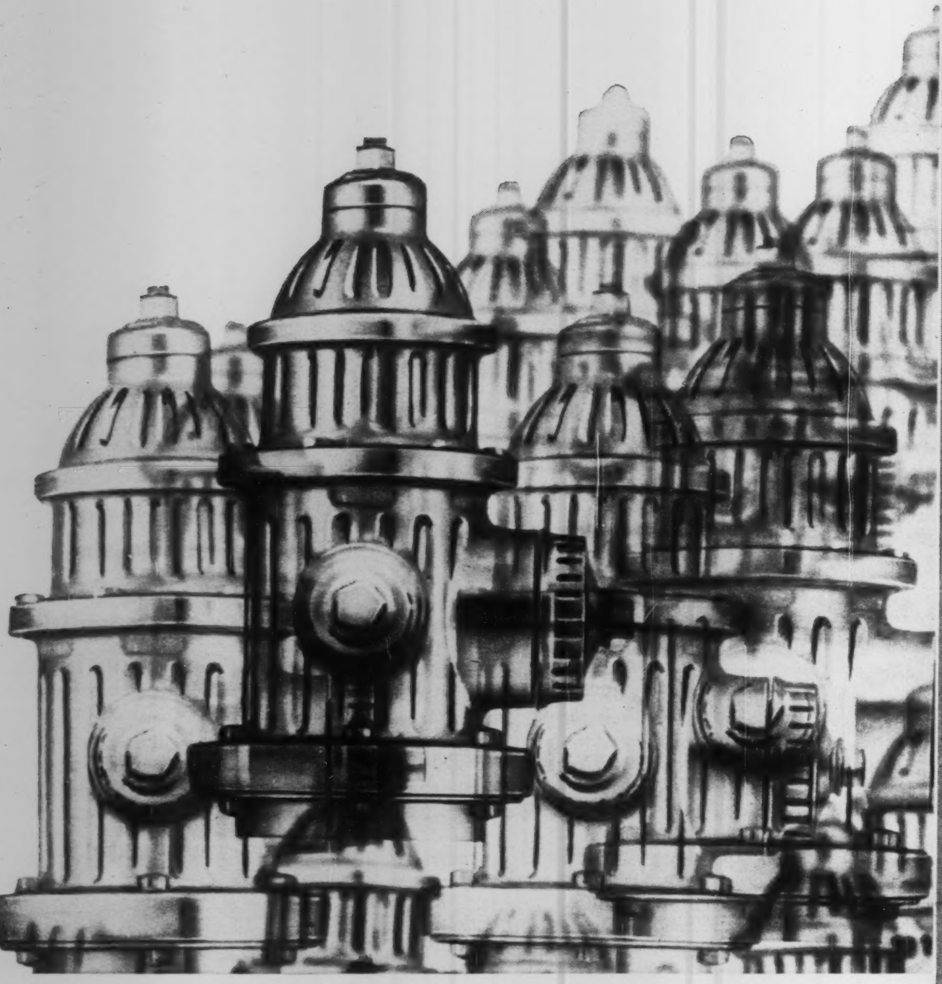
WHY YOU SHOULD SPECIFY R. D. WOOD HYDRANTS AND VALVES



Reasons? Over a million hydrants now in service throughout the world. A number like that speaks for itself, says plenty about the outstanding features of the hydrant and the excellent service and reliability you can expect with R. D. Wood products.

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Established in 1803

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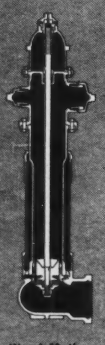
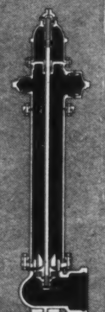
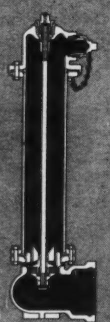
THIS IS THE R. D. WOOD LINE



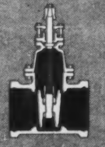
R. D. Wood Mathews Modernized Hydrant with replaceable barrel.



R. D. Wood Mathews Flange Barrel Hydrant . . . dry head construction keeps it operating in every kind of weather.



R. D. Wood Swivel Joint Hydrant can be faced in any direction.



R. D. Wood Gate Valve—bury it and forget it.

Obituaries

Robert P. Boyd, 76, Alabama's first assistant state highway engineer and founder of the American Association of State Highway Officials. Later, he had charge of the Atlanta office of the U. S. Bureau of Public Roads.

Henry Norair, 61, founder and president of the Norair Engineering Corp., which is currently building a $24-million museum of history and technology for the Smithsonian Institution. His firm, which he started in 1935, did $50 million worth of business last year.

Arthur Surveyor, 82, founder of Surveyor, Nenninger & Calvert, consulting engineers of Montreal, Canada. He had also been a member of the National Capital Planning Committee, the National Research Council and the Canadian Advisory Committee on Reconstruction.

Herbert J. Mann, 78, Pasadena architect and structural engineer who specialized in cost consulting for schools, churches and public buildings. He founded his firm in 1935 after working as a special consultant to the Federal Housing Administration.

Earl F. Kelly, 74, former chief of the division of physical research of the U. S. Bureau of Public Roads. In 36 years of government service, he won many honors for his work in highway materials.

John B. Harrington, 62, former director of the division of sanitary engineering of the West Virginia Department of Health. He was with the Department of Health from 1925 until ill health forced his retirement in 1949.

Leon D. Conkling, 88, former head of the civil engineering department of Montana State College and former state highway commissioner of Montana. He was head of the department until his retirement in 1942.

Louis P. Marciente, president of the New Jersey Federation of Labor for the last 26 years. A member of the International Brotherhood of Electrical Workers, Mr. Marciente started his career as secretary of the Mercer County Building Trades Council.

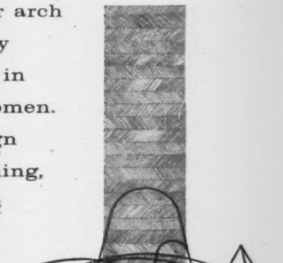
Donovan Hughes, 53, in Suriname, S. A. while working on a dam project for Aluminum Company of America. For most of the last 20 years, he was equipment manager for S. J. Groves & Sons Co., a construction company in New York City.

Commons Room of Memorial Union Building, Oregon State College, Corvallis, Oregon. Architects: Church, Newberry, Roehr & Schuette, Portland. Engineers: Cooper & Rose, Portland. Contractor: A. V. Peterson Co., Portland.

Space provided: dining hall for over 500 people; kitchen and serving area on upper level; billiard room and 10 bowling alleys on ground floor level. *Structural framing:* glulam arch frames placed side by side on 30′ centers and fanning out at 45° from each other; glulam purlins joined to arch frames at an angle and extended to outer walls. *Exterior walls:* reinforced concrete with brick veneer and Indiana limestone trim. *Interior walls:* vertical tongue-and-groove Hemlock on end walls; plaster; window walls. *Floors:* vinyl asbestos tile over precast and pre-tensioned concrete T-beam floor sections; maple floor in bowling alleys. *Heating and ventilating:* Herman Nelson unit ventilators supplied by central heating plant; units are designed for future cooling installations. *Lighting:* fluorescent over bowling alleys; incandescent elsewhere. *Roof:* cement asbestos shingles over Hemlock decking. *Area:* 19,370 square feet. *Cost:* $14.50 per square foot including kitchen equipment. Cost of glulam arch frames, purlins and end truss $0.878 a square foot erected in place.

See our catalog in
S Sweet's
or write for copy

Impressively beautiful glulam timber arch
frames create the warm, friendly
atmosphere which remains forever in
the memories of college men and women.
As a result of the unlimited design
possibilities of this structural framing,
the exterior appearance harmonizes
perfectly with that of an
older adjoining building.



TIMBER STRUCTURES, INC.

P. O. Box 3782-C, Portland 8, Oregon

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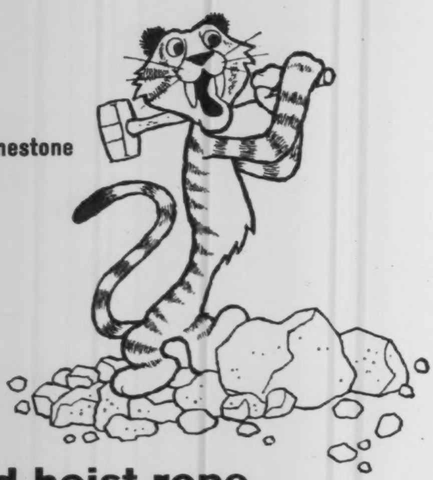


Tiger on the Spot at Michigan Limestone

USS Tiger Brand hoist rope lasts 8 months digging rock

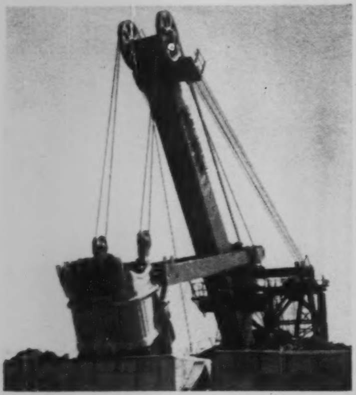
Eight months on the rock pile is a long time for any hoist rope to survive . . . but that's the average service life of USS Tiger Brand 6x41 hoist ropes on this big shovel. The rope is 2 inches in diameter and is made from tough monitor steel. Lang Lay construction gives longer wearing qualities and the wire rope core adds extra strength.

All the ropes on this shovel have the same construction. The 1⅝" counterweight ropes last about six months. The 2⅛" boom suspension ropes show no signs of fatigue and the boom hoist ropes are in excellent condition after years of service.

Tiger on the Spot. At Michigan Limestone, the Tiger Brand Field Service Representative is really on the spot. Many different types and makes of digging equipment are in use . . . and each requires different wire rope constructions. It takes an experienced man to recommend the best rope for each application. This is an important *plus* service you get when you use USS Tiger Brand Wire Rope.

Another big advantage is the wide selection of constructions available in Tiger Brand Rope. You can get the *right* ropes for your particular machines—ones that will last longer and produce more with less downtime for re-rigging.

FREE CHECK UP! Why not put the Tiger on the spot? Call in our field service representative. Have him check your machines for proper rope application. He can probably save you money. This service is available through your local Tiger Brand distributor, or write direct to American Steel and Wire, Dept. 1192, 614 Superior Ave., N.W., Cleveland 13, Ohio. USS and Tiger Brand are registered trademarks



14,400 tons per 8-hour shift—that's the average work load for these USS Tiger Brand Hoist Ropes that last for 8 months in this rugged service.

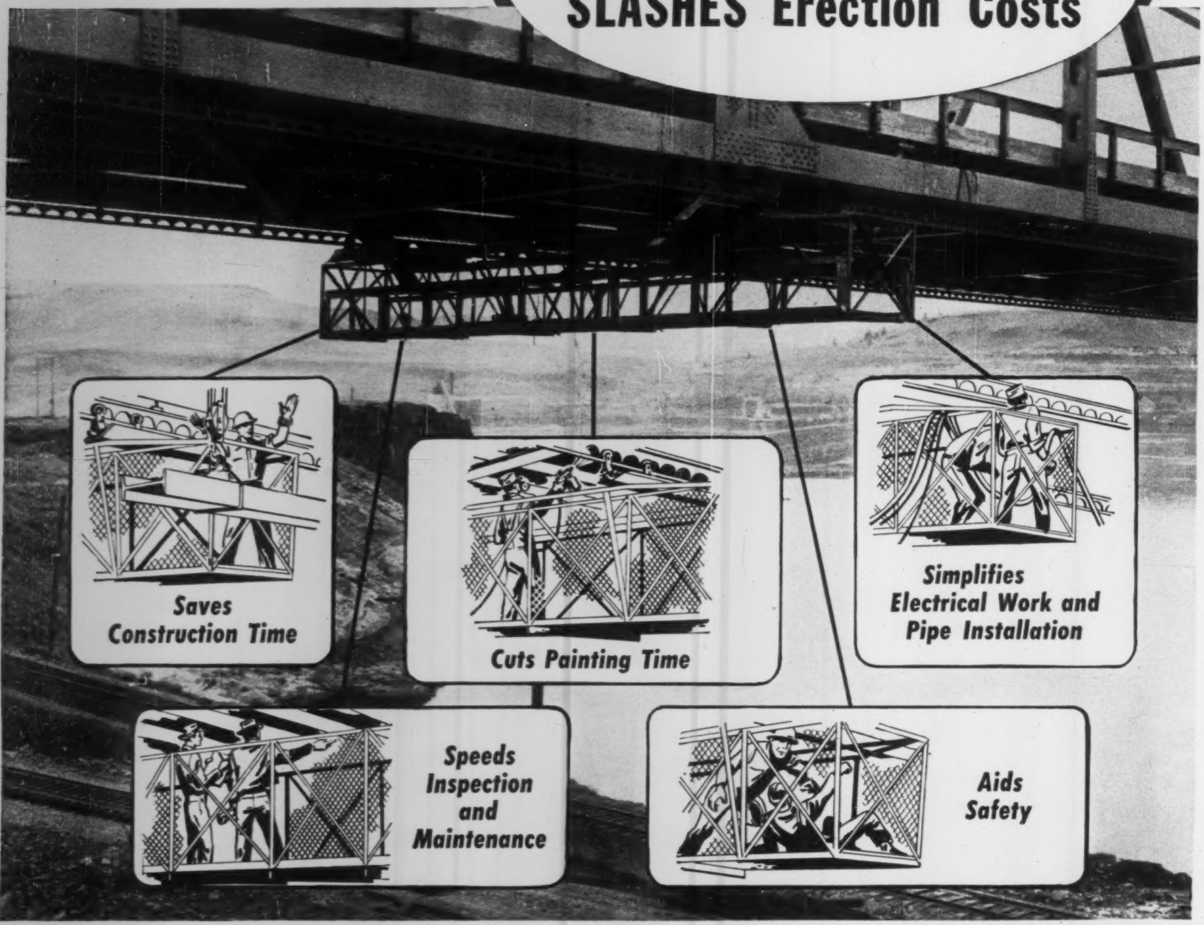
Strength, flexibility and long life are built into these Tiger Brand 6x41 Excellay Monitor Lang Lay IWRC Hoist Ropes. **All ropes**—hoist, counterweight, boom suspension and boom-hoist are USS Tiger Brand.

American Steel and Wire
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad

Illustrated is one of six Cleveland Tramrail Travelers on the Dalles Bridge over the Columbia River. Traveler length is 37'-6". Operation is by handwheel drive. Complete fence enclosure assures maximum safety.

TRAMRAIL
Bridge Traveler
SLASHES Erection Costs


Saves Construction Time
Cuts Painting Time
Simplifies Electrical Work and Pipe Installation
Speeds Inspection and Maintenance
Aids Safety

BIG savings in time and money can be made with a Cleveland Tramrail bridge system both during erection and later for inspection and servicing.

Advantages that the equipment provides for erection work alone usually justify its installation by a bridge contractor — even if not called for in the specifications. Time saved in many phases of bridge construction makes the equipment profitable. The savings do not stop with the completion of a bridge. They continue year after year by reducing man-hours required for inspection, painting and miscellaneous servicing work.

It will pay you to look into the possibilities that a Cleveland Tramrail Bridge System offers for new bridges to be built, as well as for existing ones.

CLEVELAND TRAMRAIL
ENGINEERING AND APPLICATION DATA

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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
3188 East 284th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Unit Prices

New design complicates pricing of . . . .

Shaft for Minnesota Storm Sewer

The contractor for this $1.9-million storm sewer in St. Paul, Minn., will face the new problem of constructing a sump chamber, horizontal and vertical baffles, and a special impact cup designed to dissipate the force of storm water dropping down a 140-ft shaft. The drop shaft, located at Rice and Rondo Streets, is one of the more interesting design and construction features of this job. The completed project will pick up existing storm and sanitary lines and provide drainage for an expressway still in the design stage.

Two tunnels are also included in this first sewer construction since 1936 in St. Paul's St. Peter Sandstone Formation: One 12-ft-dia, 6,703-ft-long tunnel will be constructed and one 4x6-ft, 340-ft-long existing tunnel realigned. Walter Butler Co., St. Paul, is the consulting engineer.

The impact cup was developed by the St. Anthony Falls Hydraulics Lab under the sponsorship of the city of St. Paul. The cup, designed under the direction of Dr. Sigurd Anderson, will diffuse energy created by 600 cfs of storm water falling a vertical distance of over 100 ft. Design of the horizontal and vertical baffles at the base of the shaft, as well as the shape of the sump chamber, will encourage the discharge of air that would otherwise be entrapped in the floor.

The award went to the joint venture of Foley Bros., Inc., Winston Bros. Co., and Hurley Construction Co., for $1,947,262 8.1% under second low, Al Johnson Construction Co., Minneapolis, and Lametti & Sons, Inc., St. Paul, and 26.5% below the high of five bidders.

The Foley, Winston, and Hurley combine bid $189 a foot for 4,400 lf of 12-in.-dia concrete circular tunnel, underbidding two alternate tunnel types. The semi elliptical section drew one bid, the double elliptical none. The second low bid was the only one on the semi elliptical, and was $39.80 a foot, 21%, higher than the low circular tunnel bid. The three remaining contractors bid only on the concrete circular tunnel, over shooting the combines $189 low by from $48.00 to $115.00. The tunnel, accounting for about 43% of the total cost of the project, will be through sandrock up to 150 ft in depth and will have two shafts.

The contractor will probably use hydraulic methods to mine the rock, although the use of a mining machine has not been completely discounted. Construction of the main trunk, in sandstone, is routine with little ground water expected.

It is the city's belief that the contractor will want to support the sewer throughout its entire length. But the specifications call for support only where the contractor thinks that such support is necessary to protect both his men and the work.

Three means of transporting materials are available to the contractor—rail, highway, and water. The railhead is located right at the construction site.

The concrete used will be class B (city of St. Paul designation). Cement content is 6.25 sacks per cubic yard, and compressive strength 4,000 psi.

Minimum wage rates include: skilled labor, $3.23/hr; semi-skilled, $2.85; and common, $2.75. These rates do not include fringe benefits.

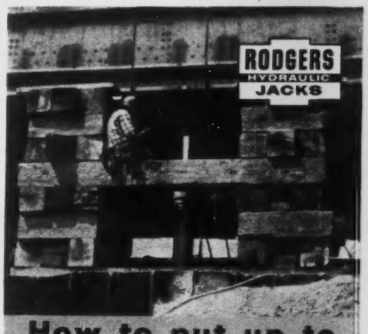
The bidding included:

1C	Foley Brothers, Inc., St. Paul, Minn., Winston Bros. Co., Minneapolis, Minn., Hurley Construction Co., St. Paul, Minn.	$1,947,262
2	Al. Johnson Const. Co., Minneapolis, Minn., & Lametti & Sons, Inc., St. Paul, Minn.	2,105,666
5	Traylor Bros., Inc., Evansville, Ind.	2,463,857
EE	Walter Butler Co., St. Paul, Minn.	2,432,634

Bids: 2-14-61 Items	Unit	Quantity	Unit Prices 1C	Unit Prices 2
Storm Water Relief Sewer				
Section I				
Outlet trans & old St. Peter St. sew div.	ls	job	$100,000	$39,059
Shaft, College Ave.	ls	job	35,000	44,338
Drill hole, storm water, sta 32+93	ls	job	25,000	17,254
Shaft & appur, Rondo Ave, Rice St.	ls	job	340,000	320,287
Tunnel, conc, circular, 12′ϕ	lf	4,400	189.00	......
alt # 1, semi-ellip, 12′ϕ	lf	4,400	......	228.20
alt # 2, double-ellip, 12′ϕ	lf	4,400	......	......
Drill holes, alignment & utility	lf	376	50.00	21.50
Pipes, grout	ea	40	25.00	9.65
Conc cores	ea	50	50.00	41.98
Grout, cement	bbl	110	75.00	36.30
Section II				
Tunnel, conc, circular, 12′ϕ	lf	2,303	189.00	......
alt # 1, semi-ellip, 12′ϕ	lf	2,303	......	231.00
alt # 2, double-ellip, 12′ϕ	lf	2,303	......	......
Drill holes, alignment & utility	lf	258	50.00	21.50
Pipes, grout	ea	10	25.00	9.70
Conc cores	ea	20	50.00	42.00
Grout, cement	bbl	50	75.00	36.30
Sanitary Diversion Sewer				
Tunnel, conc, 4′x6′	lf	340	150.00	133.95
Drill holes, alignment & utility	lf	118	50.00	22.00
Pipes, grout	ea	2	25.00	10.00
Conc cores	ea	6	50.00	42.00
Grout, cement	bbl	5	75.00	30.20
Shaft, 36″, div str, etc	ls	job	72,320	56,843
Outlet str	ls	job	2,000	6,789

Starting date: April 1, 1961
Completion date: July 15, 1962
Liquidated damages: $50.00 per day

ENR Construction Cost Index (1913=100) 20-cities average—834.27



How to put up to
600 TONS OF FORCE
at your fingertips

RODGERS hydraulic jacks give you tons of brute-force for driving culvert or sewer casings . . . jacking heavy loads . . . leveling overhead forms . . . and countless other pushing, pressing, or pulling jobs. RODGERS offers you all types and sizes, 50 to 600 tons — manual or powered, single or double-acting. Use them singly or in groups. Prompt delivery. Write for detailed bulletin.

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Pioneer in high-pressure hydraulics, since 1932
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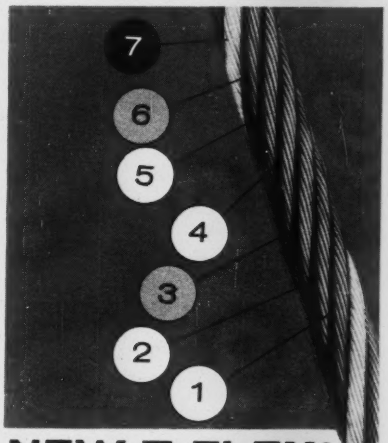

NEW 7-FLEX®
makes important savings on most wire-rope applications

All-new Macwhyte 7-strand rope is flexible as 8-strand—rugged as 6x19—fatigue-resistant like 6 x 37. You'll get longer rope life, lower costs. Get Bulletin 60100-R.

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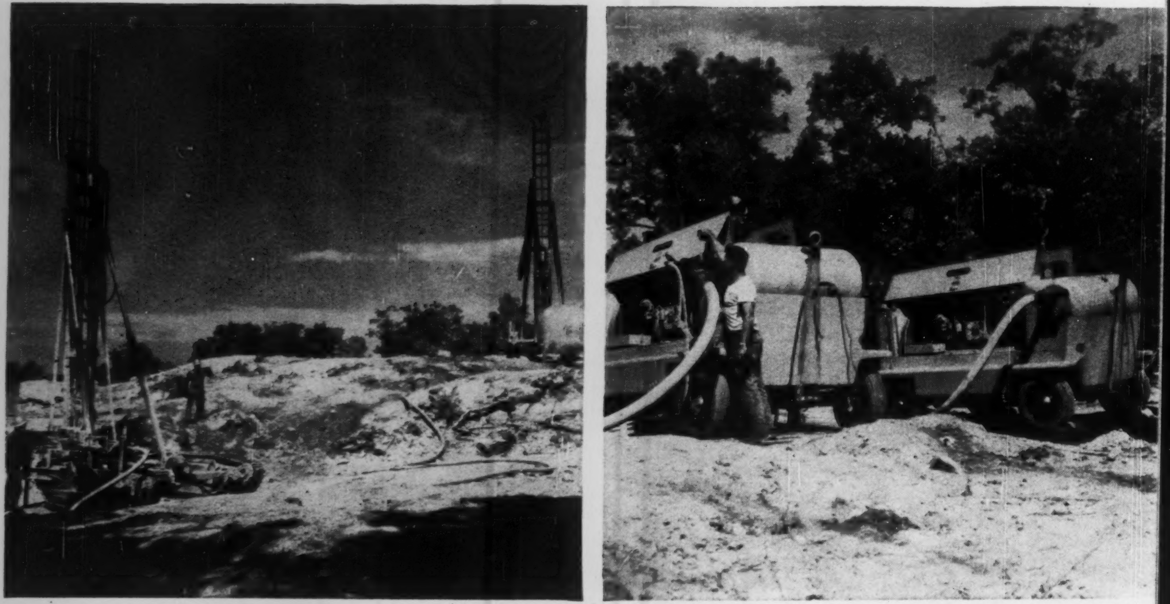
WIRE ROPE MANUFACTURING SPECIALISTS SINCE 1896

There's a JOY Compressor and Rock Drill Team



Heavyweight TDH Trac Drills mounting TM-550 drills (5½" bore) work on a large road job near Stoneham, Massachusetts. The big drills are powered by this pair of Joy RP-900 compressors. Nearly a million yards of rock are being drilled and moved on this project.

Logger in Washington carves mountain road with power take-off RT-600 portable and Joy drill-jib mounted on tractor.

No matter where your equipment has to operate, or the size of your project, there's a Joy team that is just right for your job.

Joy's line of five types of Trac Drills gives you versatility that is unmatched. From the lightweight TDL to the super heavyweight TDH, they can provide the exact drilling power you need. The medium weight TDM Trac Drill can be equipped with U-bar drill mounting or power operated boom. Match one of these carriers with one of Joy's eight large percussion drills in the right size for your job.

Joy Airvane Rotary portables are reliable in mountain cold or desert heat. In cold weather, a series of thermal by-pass valves in the oil cooling system provides instant lubrication and fast warm-up. In hottest weather, a big cooler-radiator and a highly efficient fan give Joy portables a large cooling capacity for their cfm rating. A complete line is available from 75 to 900 cfm.

Your Joy representative or nearest distributor can show you why—no matter where *your* next job—Joy has the compressor and drill team for every job. For more information write for Bulletin 2995-24.

for every job

Large mid-western quarry uses team of RP-365 compressor and TDL Trac Drill with TM 400 drill.

Contractor widens mountain roads near Niehart, Montana, with TDM Trac Drill and RP-600 team.

JOY CONSTRUCTION EQUIPMENT IS SOLD AND SERVICED BY THE JOY DISTRIBUTOR IN YOUR AREA

Portable Compressors	Trac Drills	Tungsten Carbide Rock Bits	Hand-Held Rock Drills

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company
(Canada) Limited, Galt, Ontario

Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR Issues for OTHER PRICES:

- Iron & Steel Products, Pipe: Last, May 11; Next, June 15.
- Wood Products, Glass, Explosives, Chemicals: Last, May 18; Next, June 22.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, May 25; Next, June 29.
- Wage Rates, Building Board, Lath, Insulation: Last, May 4; Next, June 29.

CEMENT, AGGREGATE, READY MIXED CONCRETE - F. O. B. CITY

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	†Toronto
Cement, Port., bulk	CL	bbl.	$3.80a	$3.91a	$3.50cf	$4.53ap	$4.02ag	$4.34c	$3.89	$3.46a	$4.39a	$3.91agq	$3.97a	$4.68ch	$4.17a	$3.65b	$4.20a	$4.01#ae	$4.62bj	$4.09a	$3.85c	$3.75ag	$3.11de#	$3.84t
paper	"	"	4.30a#	4.42a	4.43c	5.83ip	4.52ag	4.84c	4.77#	3.90a	4.89a	4.24a	4.52a	5.12ch	4.68a	4.17b	4.71a	4.51#ae	5.65bjk	4.59a	4.42c	4.47#a	3.36#de	4.20i
mortar	"	"	3.62a#	3.56a	....	4.90imp	4.15g	4.31c	4.19#ae	3.78a	4.89	3.29a	4.30a	5.60c	4.26a	3.97b	3.77a	3.63#e	5.00bjl	4.29a	4.86c	4.65a	3.72#de	4.20i
Gravel, 1½"	"	ton	2.25s#	2.80a#	2.53ns	3.00qsz	3.78#e	2.29#cu	2.25ae	2.55#a	1.95#	2.50#abm	....	2.56#at	2.70#ae	2.61b	....	1.95#a	2.68#aqv	3.50#as	2.02	4.25#bm	1.90#a	2.40
¾"	"	"	2.50s#	2.80a#	2.53ns	3.00qsz	3.78#be	2.34#cu	2.25ae	2.60#a	2.15#	2.50#abm	....	2.76#at	2.70#ae	2.61b	3.20bk	1.95#a	2.68#aqv	3.50#as	2.02	4.25#bm	2.15#a	2.40
Sand	"	"	2.00s#	2.25a#	2.13ns	3.00qsz	4.13#be	2.44#cu	1.75ae	1.65#	1.42#b	2.16#abm	1.70#a	2.41#at	1.60#ae	2.16#b	2.30bkw	1.55#a	3.08#aqv	2.50/3.50#as	2.12	4.25#bm	2.40#a	2.05
Crushed stone, 1½"	"	"	3.10s	2.85a#	2.75s	1.75qsz	3.95#be	2.55#cu	2.70fy	2.57	....	2.80#abm	2.10#a	2.41#at	4.00#ae	....	2.85blbb	2.00#a	2.00#aqv	1.75js	2.17	4.50#bm	1.90#	2.40
¾"	"	"	3.10s	2.90a#	2.75s	1.85qsz	3.95#be	2.74#cu	2.70fy	2.77	3.00#x	2.80#abm	2.10#a	2.46#at	4.00#ae	....	2.85blbb	2.30#a	2.00#aqv	1.75js	2.17	4.50#bm	2.15#	2.40
Crushed slag,* 1½"	"	"	3.90r	2.05a#	1.65d	....	2.25#e	1.80u	2.30#f	....	....	3.15aqaa	....	....	....	1.65d	....	2.25#a	2.10w	1.80	....	....	2.00	2.40
¾"	"	"	3.90r	2.00a#	1.75d	....	2.25#e	1.80u	2.30#f	....	....	3.50aqaa	....	....	....	1.75d	....	2.35#a	2.10w	1.85	....	....	2.00	2.40
Concrete block, 8"x8"x16"																								
Sand/gravel	TL	ea	0.19o	0.18a	0.19	0.23o	0.26#e	0.19o	....	....	0.25	0.24u	0.22a	0.175f	0.20q	0.25r	0.265nwo	....	0.22rx	0.26#o	0.24	0.288s	0.20	0.26
Lt. wgt. agg	"	"	0.22o	0.18a	0.19	0.305ao	0.26#be	0.25ao	0.23f	0.255	0.27ao	.27#au	0.27c	0.25	......	0.25	0.32bwo	0.20	0.22rx	0.32#co	0.28cl	0.384cs	0.28t	0.30cu
Concrete, ready-mix'r		cy	13.00g	13.50ou	14.75q	15.00q	14.00e	15.00gr	17.25u	11.50x	11.90	15.50eaa	13.50	12.46hlx	14.55f	14.00o	17.60ay	13.90z	16.15o	12.65/14.10q	12.50cw	14.70j	10.00ck	13.75q

#Delivered. * F.o.b. plant. ** Add 4% sales tax ## Add 2% Intrastate sales tax. R Revised. † Plus 6% Mun & Prov tax.

CEMENT: •a Less 10¢ disc. 15 days. •b Less 2% disc. 15 days. •c Less 10¢ disc. 10 days. •d 10¢ disc. 20 days. •e Truckload lots. •f Fob mill, add $14.58 to $21.31 per car switching charges. •g fob mill + freight. •h LCL. •i Less 2% disc. 10 days. •j Truck lots, fob yard. •k 100 bag lots. •l over 150 sacks. •m Sold in bags only. •n Less 5% disc. 30 days. •o Plus 50¢ for Sat. del. •p 5-8 ton truckload. •q F.o.b. mill •r 50 cy & over •s In bags & bbl. Only. •t min. 7 tons

SAND, GRAVEL, STONE & SLAG: •a Truck lots. •b Per cu. yd. •c 5 tons up. •d Less 5¢ disc. 10 days. •e Less 2% disc. 10th. •f Less 2% disc. 15th. •g Less 5% for cash. •h Less than 5 tons. •j F.o.b. quarry. •k Barge lots asd. •l F.o.b. scow Hudson river. •m Less 2% for cash. •n F.o.b. cars. •o F.o.b. yard. •r less 5% disc. 15th. •s Less 2% disc. 10 days. •t Less 10¢ disc. 10 days. •u Less 5¢ disc. 10 days. •v Less 2% disc. 15 days. •w Less 10¢ disc. 15 days. •x Incl. 35¢ switch charge. •y F.o.b. dock. •z 5-8 tons. •aa Less 5% disc. 15 days. •bb Less 2% 25th of month

CONCRETE BLOCK: •a Cinder. •b Waylite. •c Haydite. •d Celocrete. •e 5¼ x 8 x 12 in. •f 8 x 4 x 16 •g F.o.b. truck at job. •l F.o.b. plant San Rafael. •m F.o.b. yard. •n 8 x 8 x 18. •o Less 2% disc. 10 days. •p Less 2% disc. 10th, •q Less 5% disc. 10th. •r Less 2% disc. 15 days. •s Less 2% disc. cash. •t Siporex, 7 x 8 x 18. •u Less 5% disc. 10 days. •v Less 12% disc. 15th.

READY MIXED CONCRETE: •a 6 cu yd or over del. Man. •b 25 cu yds or more. •c 10-100 cy. •d 1-3 mi. zone add 15¢ for ea. add'l 1-mi. zone. •e 3,000 lb comp. •f 2,500 lb. comp., less 5% disc. 30 days. •g Less 25¢ disc. 15 days. •h Less 50¢ for cash. •i 5% off for cash. •j 2% off for cash. •k Federal tax included. Add 6% mun. & prov. tax. •l 1:2½:3½ base price. •m F.o.b. yard. •n Plus escalator clause. •o Less 2% disc. 15 days. •p Less 50¢ disc. 15 days. •q Less 2% disc. 10 days. Add 50¢ per zone. •r 2000 wgt. •s Less 5% disc. 10 days. •t Incl. 50¢ heating. •u Less 2% disc. 15th. •v Sat. del.+50¢. •w 10-100 cy. •x Del in zone 20-B. •y less 25¢, 10 days. •z less 1% in 30 days. •aa 6 bag mix

MILL PRICES FOR BULK CEMENT: Subject to 10¢ discount, 15 days. For paper bags add 50¢ per bbl., not refundable. *Prices guaranteed through December 31, 1961*

Richard City, Tenn	$3.55	Bath, Pa	$3.50	Northampton, Pa	$3.50	Leeds, Ala	$3.40	Howes Cave, N. Y.	$3.50	Oswego, N. Y.	$3.60	Green Bay, Wis.	$3.60
Clinchfield, Ga	3.55	Lesley, Pa	3.50	Universal, Pa	3.60	Duluth, Minn	3.60	Muskegon, Mich	3.55	Cleveland, O	3.65	Ironton, O	3.65
Kingsport, Tenn	3.55	Buffington, Ind	3.55	Waco, Tex. (+10 tax)	3.35	Hudson, N. Y.	3.50	Saginaw, Mich	3.60	Alsen, N. Y.	3.50	Montreal, Canada (a)	2.80
West Des Moines, Iowa	3.65	Independence, Kan	3.35	Giant, S. C.	3.55	Alpena, Mich	3.50	Wyandotte, Mich	3.60	Toledo, O	3.60	W. Winfield, Pa	3.61
Nazareth, Pa	3.50	Hannibal, Mo	3.55	Steelton, Minn	3.60	Detroit, Mich	3.60	Buffalo, N. Y.	3.55	Milwaukee, Wis	3.60	Security, Md.	3.50

•a 280 lb. bbl.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS - F. O. B. CITY

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
Paving brick, block-																								
Brick, 3"x4"x8½	CL	M	......e	......e	........e	........e	$150.00#ab	........e	........e	......e	......e	........e	......e	..........e	........e		........e	......e	$60.00k	......e	..........e	........e	......e	......e
Granite, 4"x4"x8"	q	M	......e	......e	$66.00i	........e	95.00#a	........e	89.50	40/80	62.00a	$114.00	......e	..........e	........e		........e	......e	95.00n	......e	$70.00	........e	......e	$120.00f#
Wood, 3½" 16 lb	...	sy	......e	......e	........e	........e	3.95/4.00aj	........e	6.30	......e	......e	........e	......e	..........e	$3.73	e	$3.70f	......e	6.35n	......e	..........e	........e	......e	4.50f
Asphalt, paving																								
Tank car	CL	ton	$0.1182W	$21.00	25.12 O	$22.00apS	22.00b	$24.00SU	26.00tA	26.90	....	31.00#	$18.75cl	$18.00dmx	23.70	$20.00e	22.90mO	0.22u	31.20isv	$19.74	22.50gdd	$24.00z	$30.50n	38.90
Drummed	CL	gal.	0.1220W	....	25.69	46.00apS	32.00b	....	....	46.35	....	....	....	....	....	....	67.83mO	....	....	21.65	41.00gdd	47.00h	43.60n	59.01ee
Asph. binders, fluxes																								
Tank car	CL	ton	0.1182W	0.9i	0.1069	22.00avS	20.40bv	24.00ffv	26.00tvA	.1138	....	31.00#	18.75cv	18.00dvx	23.70	20.00ev	22.90vtO	0.22u	31.20isv	.1825f	22.50gkvdd	33.00vscc	0.167n	0.2075ee
Drummed	CL	gal.	0.1220W	0.18i	0.1093	46.00avS	30.40bv	....	....	.1983	....	....	....	....	....	....	67.83vtO	....	....	.1825	40.00gkvdd	38.50	0.211n	0.2773w
Asph. cutback, MC																								
Tank car	CL	ton	0.1222W	0.9i	0.1163w	0.105awF	.10bwH	0.1165twAF	0.1165wSU	30.50	....	30.24wl#	.0825cwJ	19.50dKx	0.105w	0.095ew	10.16uF	0.10U	0.1403#S	.09f	22.50gNdd	25.50KE	17.80nuE	0.222wee
Drummed	CL	gal	0.1258W	0.18wE	0.1188Ow	0.22awF	.18bwH	....	....	52.45	....	....	....	....	....	....	29.62uF	....	....	.092fw	46.50gNdd	....	22.20nuE	0.2704
Road oil, tank car	CL	gal	....	0.95i	0.1006O	0.14aOR	.08b	0.109	....	.1100	....	27.84v	.0675tr	18.50dvaa	0.95	0.085eB	....	0.095U	0.14#S	.165f	23.25gvWdd	28.75hvY	0.155n	0.2334w
Asph. emul. RSI																								
Tank car	CL	ton	0.1288W	0.10i	0.1069	0.15OR	....	0.1265	0.1265tA	0.1138	....	....	.10	21.40jXv	0.137bb	0.095eBL	10.15u	....	0.1403i	.18250	23.50gvXdd	25.80hvX	0.242n	0.212Zee
Drummed	CL	gal	0.1327W	0.19i	0.1093O	....	....	....	0.21A	0.1983	....	0.29	....	.1842jXv	....	0.1905eB	29.81u	....	....	.30	.2023gXdd	49.80hrvX	0.27nX	.268Zee

PAVING BRICK & BLOCK: •a Less 2% disc. 10th. •b 3 x 3¾ x 8. •c 2¼ x 8 x 4. •d Truckload lots. •e Not used. •f 2" interior 6 lb tr. •g Less $1/Mdisc. 15th. •h 2" tr. 8 lb. •i 3 x 3⅝ x 8½. •j 2½", 6 lb. tr. •k Used. •l Redshale. •m Pine; oak $6.57. •n Truck del. •o Less $1 M disc. 15 days. •p Used: $40; new: $80. •q Lots of 50M.

ASPHALTS: •a F.o.b. refinery, Everett, Mass. •b F.o.b. refinery, Lockport, Ill. •c F.o.b. Sugar Creek, Mo. •d F.o.b. refinery, El Segundo. •e F.o.b. Baton Rouge. •f F.o.b. Hartford, Ill. •g F.o.b. refinery, Richmond, Calif. •h F.o.b. Martinez. •i F.o.b. refinery, Baltimore. •j F.o.b. refinery, Inglewood, Calif. •k 50-110 penetr. •l Less than 100 penetr. •m 40/300 penetr. •n F.o.b. refinery, Montreal. Fed. tax included; add 6% for mun. & prov. •o Drums not avail. Shipped in steel bbl. •p 60/70 penetr. •r In customer's drums. •s Shipped in drums, per drum. •t 150/300 penetr. •u Per 100 gal. •v Per ton. •w Per gal. •x Also tank trucks •y F.o.b. Oakland. •z F.o.b. Edmonds. •A F.o.b. refinery, Cleveland. •B F.o.b. Destrehan, La. •E RC. •F Also RC. •G Also MS •H RC 0-5 incl. •I MC 4. •J MC, RC $0.095. •K MC 3, 4, & 5. •L MS. •M MC 1-5, RC 1-5, $0.0918. •N MC 3. •O Truckload. •P F.o.b. refinery, Atlanta. •Q F.o.b. Eldorado, Ark. •R Delivered within 50 mi. •S Less 2% disc. 10 days, net 30. •T Less 1% disc. 10 days. •U F.o.b. refinery. •V Less 2% disc. 15 days. •W SC 2. •X RS 1. •Y SC 1. •Z Incl. 10% Sales Tax. •aa SC 3, 4, & 5. •bb RS 3. •cc In used drums. •dd less disc of $1 ton. •ee 45 Imp. gal. drums •ff 60-150 penetration

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., Springfield**—BA 7/7—City, School Bldg. Comn., City Hall, M. Marcus Kiley JUNIOR HIGH SCHOOL, 180 Cooley St. $2,750,000. Plans deposit $100. Donald S. Gilman, 1618 Main St., archt. CD 7/11/58.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth Mass., Dpt. P. Wks., 100 Nashua St., Boston, ROAD,

Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I., CA **$2,681,362**, est. $2,809,541, section Interstate Rtes. 495 and 125 incl. 3 bridges, FAP 1-495-6(34) 84-U377(1) & U-133(4), Haverhill. BA 4/25, CA 5/25. CD 4/27/61, under LB.

BUILDINGS—LB & CA

▲ **Oneglia & Gervasini, Inc.**, Casson Ave., Torrington, Conn., CA **$2,922,360**, 3 story, 4 unit 2 wing HIGH SCHOOL, Elise Besse Park, TORRINGTON, CONN. Town, Purch. Agt., Town Hall, Torrington, Conn. BA 5-5-61. CD 5/10/61, under LB.

▲ **W. J. Megin, Inc.**, 51 Elm St., Naugatuck, Conn., CA Est. **$5,000,000**, PAPERBOARD MILL and POWER PLANT, VERSAILLES, CONN. Federal Paper Board Co., Inc., 24 River Road, Bogota, N. J. CD 3/8/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **NEW YORK**—BA 6/28—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 35, BRIDGE,

Narrows Bridge Contr. No. NB-6, suspended structure and decks on anchorages to incl. steelwork and concrete paving for two level suspended structure. Plans deposit $100. CD 1/20/55.

BUILDINGS—BA

▲ **N. Y., New York**—BA 6/20—New York City Housing Auth., Rm. 312, 299 Broadway, New York, Zone 7, (1) fdns. and general constr. (2) heating ventilating, (3) electric work and (4) plumbing work, Baychester HOUSES, Proj. No. NYS-92, Schieffelin Ave., E. 229 St., Schieffelin Pl. and E. 225 St., Bronx Boro. Plans deposit $75; furnishing and installing ELEVATORS at Baychester Houses. Plans deposit $25. CD 5/12/61, under LB.

▲ **N. Y., Lake Ronkonkoma**—BA 6/27—Sachem Central School Dist. No. 5, School Dist., 1 story Sagamore JUNIOR HIGH SCHOOL, Holtsville. $2,358,000. George J. Dippell, 187 Brooklyn Ave., Massapequa, archt. Kenneth Tomann, 450 7 Ave., New York, Zone 1, struct. engr. Phillips & Elbal, 101 Park Ave., New York, Zone 17, mech. engrs. CD 4/5/61.

BUILDINGS—SLC

▲ **N. J., Elizabeth**—St. Elizabeth's Hospital, 204 South Broad St., soon lets contract, 5 story HOSPITAL ADDN., South Broad St. $5,363,000. Eggers & Higgins, 100 East 42nd St., New York 17, N. Y., archts. CD 5/2/61.

▲ **N. Y., New York**—50 W.44 St. Bldg. Corp., 50 W. 44 St., Zone 19, soon lets contract 12 story OFFICES ADDN. to 8 story bldg. and alterations $7,000,000. Kahn & Jacobs, 2 Park Ave., Zone 16, archts. Weiskopf & Pickworth, 230 Park Ave., Zone 17, struct. engrs. Syska & Hennessey, 144 E.39 St., Zone 16, mech. engrs. CD 5/2/61.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROADS,

N. Y.—**D. A. Collins Co., Inc.**, Box 191, Mechanicville, N. Y., CA **$4,556,345**, est. $5,037,000, c. conc. pavt., grading, 1.96 mi. City of Albany, Crosstown Rte. Art. Hy. (Krumkill Rd. to Washington Ave.) Slingerlands-Albany SH 5237 Proj. U 392(12) Contr. FAC 61-6, FARC 61-25, Albany Co.;

N. Y.—**R. D'Angelo & A. Stento Contr., Inc.**, P. O. Box "C", Apalachin, N. Y., CA **$844,972**, est. $990,000, b. conc. Type 1A, 6.86 mi. Fleming-Scipio, Pt. 2, SH 1327, Fleming-Scipio, SH 753, Poplar-Ridge-Fleming, SH 5244, Fleming-Auburn, SH 5012, Proj. F 1155 (2) S 673(2) Contr. FARC 61-53, Cayuga Co.;

N. Y.—**Fred W. Ewing, Inc.**, 405 W. Main St., Corry, Pa., CA **$885,147**, est. $983,000, b. conc. Type 2A 1.89 mi. City of Jamestown north-south art. hy. (Washington St-Pluvanna Ave.) Proj. U 861(4) Contr. FAC 61-10, Chautauqua Co.;

N. Y.—**The S. DeLia Corp.**, 30 Compion Rd., N. Hartford, N. Y., CA **$635,348**, est. $815,000, b. conc. 5.25 mi. New Woodstock-Cazeno via Village, Pt. 1, SH 5676 Cacenovia Village, Pt. 1, SH 5675, Proj. S 54(2) F 470(20). Contr. FARC 61-56, Madison Co.;

N. Y.—**Walter P. Blimm Co., Inc.**, 270 State Rd., Lockport, N. Y., CA **$622,497**, est. $790,000 b. conc. Type 1A 6.06 mi. North Tonawanda-Shawnee SH713, Shawnee-Cambria SH 729, Contr. R.C. 61-61, Niagara Co.;

N. Y.—**John Bros. Inc.**, 37 Hall St., Binghamton, N. Y., CA **$698,538**, est. $916,000, b. conc. Type 1A, twin rein.-conc. closed box bridges, twin rein.-conc. open box bridges 4.15 mi. Weedsport-Jordan Pt. 2 SH 5630, Jordan Village, N. Main St., SH 1505 Jordan-Baldwinsville Pt. 1, SH 1506, Proj. F 185(6) Contr. FARC 61-58, Onondaga Co.;

N. Y.—**Warren Brothers, Inc.**, Thompson Rd., Syracuse, N. Y., CA **$555,310**, est. $709,000, b. conc. Type 1A, 14.78 mi. Mexico-Selkirk State Park Pts. 1 and 2, SH 8458, Port Ontario-Jefferson Co. 1 NE, SH 8420, Contr. R. C. 61-48, Oswego Co. Grand total $8,798,157. BA 4/27, CA 5/8. CD 4/28/61, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROAD,

Torrington Constr. Co., P. O. Box 336, 116 E. Main St., Torrington, Conn., CA **$2,358,369**, est. $4,033,000, b. conc. 2.76 mi. (1.79 acc.) 1 HGSC comp. beam 4 sps. 227.2 ft. total, 2 bridges welded steel plate girder, 3 spans 319 ft. total, 3 spans 319 ft. total, 5 HGS prestressed conc., 3 spans 139.4 ft. total, 3 spans 151.3 ft. total, 3 spans 121.8 ft. total, 3 spans 121.8 ft. total, 6 spans 351.3 ft. total Int. Rte. 502, Sections 7A1 and 7A2, Rte. 9 to Rte. 22, FISH 61-8. Proj. I-87-4 (18), Clinton and Essex Counties. BA 3/29, CA 5/1. CD 4/5/61, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 5/25, ROAD,

Franklin Contg. Co., U.S. Hy. 46, Little Falls, N. J., LB **$4,133,662**, (9 bidders), constr. interchange connecting Interstate Rte. 80 with N. J. Rte. 17 in Hackensack, Lodi and Teterboro, Bergen Co. CD 4/27/61.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, ROADS,

Public Constructors, Inc., P. O. Box 34, Blackwood, N. J., CA **$3,959,671**, grading, paving, bridges for 2.997 mi. Rte. 287, Section 3A, from Stelton Rd. to New Durham Rd., Middlesex Co. BA 5/4/61, CA 5/29/61. CD 5/8/61, under LB..

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 5/26, ROADS,

Pa.—**Putnam & Greene, Inc.**, Box 2082, Station A, Fort Wayne, Ind., LB **$4,122,037**, (11 bidders), 17,784 ft. separated RCC hy. 24 ft. wide each side of median area; 4 bridges, Western sect. of Brookville bypass, on Keystone Shortway, Jefferson Co.;

Pa.—**Herbert R. Imbt, Inc.**, Box 155, State College, Pa., LB **$4,282,789**, (4 bidders), 11,269 ft. cr. agg. base with bit. surf. 24 ft. wide, L. R. 39011(5), Lehigh Co. CD 4/27/61.

BUILDINGS—LB & CA

▲ **Midlawn-Central Organization**, 24-30 E. 56 St., Brooklyn, N. Y., Owner Builds, **$6,000,000**, 200 two-family HOMES, Glenwood Rd. and E. 81 St., BROOKLYN, N. Y. Stanley Klein, 89-31 161 St., Jamaica, N. Y., archt.

▲ **General Services Admin.**, P. Bldgs. Service, 250 Hudson St., New York 13, N. Y., rejected bids Apr. 3, build-lease 40,000 sq. ft. OFFICE, LABORATORY, STORAGE and GARAGE SPACE for use by Department of Health, Education and Welfare, Food and Drug Administration, BUFFALO, N. Y. LB **$15,000,000**. CD 4/6/61, under LB.

▲ **William A. Berbusse Jr. Inc.**, 11 Virginia Rd., White Plains, N. Y., CA **$3,936,200** HOSPITAL ADDN., MANHASSET, N. Y. North Shore Hospital, Valley Rd., Manhasset, N. Y. BA 3/23. CD 3/23/61.

▲ **Howard Barnaby & S. G. Schimenti**, c/o Depot Constr. Corp., 42-15 Crescent St., Long Island City 1, N. Y., Owner Builds, **$5,000,000**, 20 story, 140,000 sq. ft. OFFICE and STORES, 814-822 2 Ave. Sec. Ave. and 44 St., NEW YORK, N. Y. Henry George Greene, 855 6 Ave., New York 1, N. Y., archt. Sidney Barbanel, 29-46 Northern Blvd., Long Island City 1, N. Y., mech. engr. A. L. Delaney & Assocs., 147 W. 35 St., New York 1, N. Y., struct. engrs. CD 12/22/60.

▲ **Emil Muller Constr. Co.**, 70 South Ave., Rochester, N. Y., CA **$2,925,000**, GARDEN APARTMENTS, ROCHESTER, N. Y. Chatham Gardens, Inc., c/o Renar Designs Inc., archt., 68 South Ave., Rochester, N. Y. Faragher & Macomber, 900 Powers Bldg., Rochester, N. Y., consult. archts.

▲ **Paul Zuckerman**, c/o Brounell & Kramer, 1478 Morris Ave., Union, N. J. Owner Builds, **$4,500,000**, 175 HOUSES off Mildred Terrace, CLARK, N. J. Katz & Metsky, 875 Broad St., Newark, N. J., archts.

▲ **James Luke**, 20-15 Morris Ave., Union, N. J., CA **$2,899,000**, 120 HOUSES off Rte. 202, WAYNE, N. J. Esquire Estates, 20-15 Morris Ave., Union, N. J. H. B. Southern, 571 East Hazlewood Ave., Rahway, N. J., archt.

▲ **Homes by Barry Louis, Inc.**, 938 Brighton St., Phila., Pa., Owner Builds, **$5,000,000**, 22 homes, RESIDENTIAL DEVELOPMENT, swimming pool, club house, Rising Sun, PHILA, PA

▲ **Boyd H. Kline**, Old Berwick Rd, Bloomsburg, Pa., CA **$4,102,326**, general contract 4 WARD BLDGS., sewage treatement plant, water, heat and sewerage systems, roads, White Haven State School, WHITE HAVEN, PA. General State Authority, 18th and Herr Sts., Harrisburg, Pa. Grand total $6,137,173, BA 5/10/61. CD 5/12/61, under LB;

Welsbach Corp., 1500 Walnut St., Phila. Pa., CA **$1,256,947**, HEATING and VENTILATING for White Haven State School, (White Haven, Pa.);

Hughes Corp., 245 Charles St., Luzerne, Pa., CA **$777,900**, PLUMBING, for White Haven State School, (White Haven, Pa.)

▲ **Cogswell Constr. Co.**, 513 Park Ave., Baltimore, Md., CA **$3,000,000**, Boys CATHOLIC HIGH SCHOOL, Caton and Wilkens Aves., BALTIMORE MD. R. C. Archdiocese of Baltimore, 408 N. Charles St., Baltimore, Md. CD 12/8/60.

▲ **Tri-County Constr. Co.**, 204 Reamer Ave., Richardson Park, Wilmington, Del., Owner Builds, **$4,000,000**, RESIDENTIAL DEVELOPMENT (322), Rte. U. S. 13, DOVER, DEL.

SOUTH

BUILDINGS—BA

▲ **Tenn., Nashville**—BA 6/20—Vanderbilt University, 21st Ave. S., two 11 story total 240 units, **APARTMENTS**, $3,000,000. Extended date. Plans **deposit** $250. Brush, Hutchinson & Gwinn, 1719 West End Ave., archts. CD 5/24/61.

▲ **Fla., Port Tampa**—BA 6/22—National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y., MFG. PLANT and WHARF FACILITIES, $6,000,000. CD 11/28/60.

HEAVY CONSTRUCTION—LB & CA

▲ **Harford Brothers**, P. O. Box 191, Emporia, Pa., CA land portion, 15.8 mi. 24 in. DISTRIBUTION LINE from Hybla Valley near Alexandria, Va., across Potomac River to Prince Georges County, Md., VIRGINIA and MARYLAND. Washington Gas Light Co., 1100 H. St. N. W., Wash., D. C. Total estimate **$3,800,000**. BA 5/15/61. CD 4/25/61;

Popich Marine Constr., Inc., P. O. Box 26343, New Orleans, Zone 26, La., CA river portion, DISTRIBUTION LINE from Hybla Valley near Alexandria, Va. across Potomac River into Prince Georges Co., Md., (Virginia and Maryland).

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City 1, Iowa. CA **$15,372,993**, DAM, DIKES, SPILLWAYS, Summersville Reservoir Proj., Gauley River, WEST VIRGINIA, U. S. Eng., 502 8th St., Huntington, 1, W. Va. BA 5/16/61. CD 5/19/61.

▲ **NORTH CAROLINA**—State Hy. Comn., Capitol Bldg., Raleigh, Bids opened 5/23, ROADS,

N. C.—**Dickerson, Inc.**, Box 448, Monroe, N. C., LB **$245,510**. b. conc. base, binder surf. 13 mi. widening, resurf. US 64 from Ruth, northeast to McDowell Co. Line, Proj. W.O. 6.800291, Rutherford Co.;

N. C.—**Burns & Spangler**, Shelby, N. C., LB **$241,607**, grading CABC, BST or S.A. surf., structures 2.54 mi. from point on US 21 0.7 mi. west of Mt. Mourne, northwesterly along or near Secondary Rd. 1109 to its intersection with Secondary Rd. 1100, Proj. 8.29371 Iredell Co.;

N. C.—**Clement Bros.**, Hickory, N. C., LB **$2,620,611**, grading, CABC, b. con. base, surf. 5.33 mi. East Section of Canton ByPass between Beaverdam Rd. and George's Branch. 8.19431, I-40-1(8)34, Haywood and Buncombe Counties. CD 5/4/61.

▲ **ALABAMA**—State Hy. Dpt., Montgomery Zone 4, Bids opened 5/19, ROADS,

Ala.—**Southeastern Sand & Gravel Co., Inc.**, Frank Len Bldg., Montgomery, Ala., LB **$2,468,549**, base and bit. paving 15.641 mi. from Opelika NE to Georgia State Line on Inter Rte. 85, Chambers and Lee Counties;

Ala.—**W. S. Fowler Rental Equipment Co.**, Oneonta, Ala., LB **$1,302,471**, grading, draining 6.849 mi. from Etowah County line NE to Ala. 68 near Collinsville on Inter. Rte. 59, DeKalb Co. CD 5/61.

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4, ROADS,

Ala.—**Robert R. Dunn Constr. Co.**, Troy, Ala., CA **$2,524,618**, 8.691 mi. base and conc. pave. from Sepulga River NE to Ala. 106 on Inter Rte. 65, Butler Co.;

Ala.—**Clyde O. Mitchell**, 2890-35th Ave. N., Birmingham, Ala., CA **$1,022,672**, grading, bit. paving and bridges from Dillingham St. in Phenix City S. to Brickyard Rd. and from near US 431 E. to Chattahoochee River, Russell Co., BA 4/21/61, CA 5/16/61. CD 4/26/61, under LB.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, ROAD,

Ky.—**Codell Constr. Co.**, Codell Bldg., Winchester, Ky., LB **$3,618,529**, (6 bidders), c. conc. pavt. 4.373 mi. East Ky. Turnpike, EK2-3, Powell and Wolfe Counties;

Ky.—**Ruby Constr. Co.**, 101 Sugg St., Madisonville, Ky., LB **$2,524,350**, (2 bidders), high type surf. 0.612 mi. various roads, EI 64-2(16) EU 550(2), Jefferson Co. CD 5/12/61.

▲ **Malan Constr. Co.**, 2 Park Ave., New York, N. Y., CA **$2,660,000**, SEWAGE IMPRVS., Contr. 9, LEXINGTON, KY. City, Municipal Bldg., Lexington, Ky. BA 1/24. CD 1/26/61, under LB.

▲† **Reynolds Metals Co.**, 660 W. Broad St. Rd., Richmond, Va., CA **$4,226,798**, CONDUCTOR CABLE Melton Hill Dam, TENNESSEE. Tennessee Valley Authority, New Sprankles Bldg., Knoxville, Tenn. Grand total $4,621,767. CD 3/28/61;

Nashville Bridge Co., Foot Shelby Ave., Nashville, Tenn., CA **$96,949**, RADIAL SPILLWAY GATES, Melton Hill Dam, (Tennessee);

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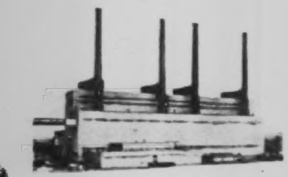

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Rome Cable Corp., Chattanooga, Tenn., CA **$96,900**, CONDUCTOR CABLE, Melton Hill Dam, (Tennessee); **West Kentucky Coal Co.**, Madisonville, Ky., CA **$201,120**, COAL, Melton Hill Dam, (Tennessee).

BUILDINGS—LB & CA

▲ **A. B. Newton & Co.**, P.O. Box 191, Vidalia, Ga., CA **$4,670,000**, 450-unit Low Rent HOUSING and MANAGEMENT BLDG., Proj. VA-7-8, RICHMOND, VA. Richmond Redevelopment & Housing Auth., 901 Chamberlayne Parkway, Richmond, Va. BA 5/4/61, CA 5/24/61. CD 5/5/61, under LB.

▲† **H. L. Coble Constr. Co.** 415 N Edgeworth St., Greensboro, N. C., CA **$6,719,391**, 430 units CAPEHART HOUSING, Turner Air Force Base, INV-09-629-61-39, ALBANY, GA. Base Procurement Office, Turner Air Force Base, Albany, Ga BA 3/16/61. CD 4/18/61, under LB.

▲ **Morris S. Burk Bldg.**, 12777 NE 14th Ave. N. Miami, Fla., CA **$3,500,000**, Terrace Towers, CO-OP APARTMENTS, pool, garage. No. 3 Island Ave., Belle Isle—Ventian Causeway, MIAMI BEACH, FLA., Belle Isle Apartment House, Algiers Hotel Collins Ave., Miami Beach, Fla. Lapidus, Kornblath, Harle & Liebman, 940 Lincoln Rd. Miami Beach Fla., archts., Oboler & Clarke, 927 Arthur Godfrey Rd., Miami Beach, Fla., struct. engrs.

▲† **A. C. Samford**, 630 Slappey Dr. P.O. Box 1229, Albany, Ga., LB **$6,894,810** (8 bidders), 498 units CAPEHART HOUSING, ENG-01-076-61-70B, FORT RUCKER, ALA. U. S. Eng., P.O. Box 1169, Mobile, Ala. BA 5/24/61. CD 5/1/61.

MIDDLE WEST

BUILDINGS—BA

▲ **O., Cincinnati**—BA 6/20—Union Central Life Insurance Co., 5 W. 4th St., brick, stone OFFICE, Waycross and Mill Rd. $7,500,000. Plans deposit $100. Harley-Ellington-Day, Inc., 153 E. Elizabeth St., Detroit, Mich., and Cellarius & Hilmer, 4th and Main Sts., archts. CD 10/25/60.

HEAVY CONSTRUCTION—LB & CA

▲† **Powers-Thompson Co.**, 27 S. Chicago St., Joliet, Ill., LB **$2,575,951**, (13 bidders), MAIN DAM-GATED SPILLWAY Carlysle Reservoir, east side Kaskaskia River, Clinton Co., near Carlyle, ENG-23-066-6176, ILLINOIS, U.S. Eng., 420 Locust St., St. Louis, 2, Mo. BA 5/24/61. CD 4/6/61.

▲† **U. S. Eng.**, 1101 Washington Blvd., Detroit 26, Mich., rejected bids May 16, 3,080 ft. wood frame CHAPEL ADDNS., 720 sq. ft. paving, sidewalks, utilities, Kincheloe Air Force Base and K. I. Sawyer Air Force Base, ENG-20-064-61-55, MICHIGAN. LB **$4,340,575.** Will re-advertise. CD 5/24/61, under LB.

BUILDINGS—LB & CA

▲ **Turner Constr. Co.**, 602 Main St., Cincinnati, O., CA Est. **$2,500,000,** Fontbonne WOMENS RESIDENT HOME, northeast corner 5th and Broadway Sts., CINCINNATI, O. Sisters of St. Joseph, 425 E. 5th St., Cincinnati, O. CD 9/21/60.

▲† **Malan Constr. Corp.**, 2 Park Ave., New York, N. Y., CA **$14,790,000**, 800 bed G. M. & S. HOSPITAL and Regional OFFICE MEDICAL CLINICS, Veterans Admin., E. 105th St. and East Blvd., Wade Park, CLEVELAND, O. Veterans Admin., Munitions Bldg., Wash., D. C. BA 5/9/61. CA 5/26/61. CD 5/11/61 under LB.

▲ **Wargo Realty, Inc.**, 9219 Miles Ave., Cleveland 5, O. Owner Builds, **$5,400,000**, 180 addnl. Sagamore Hills Estates HOMES, MACEDONIA, O.

▲† **Edward Gray Corp.**, 12233 S. Ave. O, Chicago, Ill., CA **$2,741,700**, CHEMISTRY HOT LABORATORY WING ADDN. (Bldg. 200) LEMONT, ILL. U. S. Atomic Enegry Comn., 9700 S. Cass Ave., Argonne, Ill.

▲† **Knapp-Stiles, Inc.**, 1555 Eastern Ave., Grand Rapids, Mich., LB **$3,067,500**, 190 units CAPEHART HOUSING, No. 3, KINCHELOE AIR FORCE BASE, MICH. Base Procurement Office, Kincheloe Air Force Base, Mich. BA 5/25. CD 4/14/61.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲ **Minn., Circle Pines**—BA 7/25—Dir. Procurement, Rm. 19, State Capitol, St. Paul, Base Bid A, fabrication, installation ELEVATED STORAGE TANK, constr. tank house, drilling and constr. water well, pump house, related equipment and facilities and site work; Base Bid B, excav. for site work, grading, finished work, etc.; Base Bid D, general constr. work; Base Bid E, plumbing, utilities, heating and piping sys. and thermal insulation and automatic temperature control work; Base Bid F, ventilation and refrigeration work; Base Bid G, combined bid for E&F; Base Bid I, SEWAGE DISPOSAL PLANT, incl. general constr. work; Base Bid J, electrical work; Base Bid K; kitchen and food services equipment; Base Bid L, combined bid A, B, D, E, F, G, I, etc. Minnesota Youth Center, Lino Lakes, Anoka Co. Total est. approx. $4,900,000. Walter Butler Co., 1300 Minnesota Bldg., St. Paul 1, Minn., archts.-engrs. Plans deposit $50. CD 4/8/58.

BUILDINGS—BA

▲ **Iowa, Council Bluffs**—BA 6/22—Bd. Trustees, Jennie Edmundson Memorial Hospital, Oak and Pierce Sts., HOSPITAL ADDN. $2,500,000. Plans deposit $100. Leo A. Daly Co., 8600 Indian Hills Dr., Omaha, Neb., archt. CD 4/1/60, under LB.

▲ **Kan., Great Bend**—BA6/27—Community Hospital Assocs. Inc., c/o Earl Immenschuh, 3623 Broadway, 4 and 5 story, rein.-con., masonry air conditioned MEDICAL CENTER MAIN BLDG., 40 x 120 ft. BOILER and MAINTENANCE BLDG. $2,880,000. Shaver & Co., 205½ South Santa Fe St., P.O. Box 1118, Salina, archts. James A. Hamilton Assocs., 425 Harvard St. S.E., Minneapolis, Minn., hospital consultants. CD 3/15/61.

HEAVY CONSTRUCTION—LB & CA

▲† **List & Clark Co.**, 2 W. 40 St., Kansas City 11, Mo., LB **$4,054,338**, est. $3,499,709 (7 bidders), Schedule 3; LB **$3,186,467**, est. $2,697,574 (7 bidders), Schedule 1, RELOCATING U.S. Hy. 64, Keystone Reservoir, Arkansas River, CIVENG-34-066-61-103, OKLAHOMA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids 5/16/61. CD 4/10/61.

Ace Constr. Co., 8711 Sherwood Rd., Omaha, Neb., LB **$863,105**, est. $823,106 (6 bidders), Schedule 2, relocation of U.S. Hy. 64 in Keystone Reservoir of Arkansas River (Oklahoma).

Frost Constr. Co., Box 218, Hydro, Okla., LB **$236,645**, est. $230,978 (7 bidders), Schedule 6, relocation of U.S. Hy. 64 in Keystone Reservoir of Arkansas River (Oklahoma).

Austin Bridge Co., Box 1590, Dallas, Tex., LB **$139,705**, est. $146,523 (8 bidders), Schedule 4, relocation of U.S. Hy. 64, Keystone Reservoir, Arkansas River (Oklahoma).

Frank Newell & Son, Box 947, Muskogee, Okla., LB **$83,380**, est. $84,135 (6 bidders), Schedule 5, relocation of U.S. Hy. 64, Keystone Reservoir, Arkansas River (Oklahoma).

▲ **TEXAS**—State Hy. Comn., Austin, BRIDGE,

Cage Bros., 6959 San Pedro Ave., San Antonio, Tex., CA **$2,588,297** (7 bidders), Nueces Bay Causeway and apprs., 2.928 mi. Hy. U. S. 181, F-18 (11) & U 204 (13), San Patricio and Nueces Counties, BA 5/20/61, CA 5/30/61. CD 5/25/61, under LB.

▲ **MONTANA**—State Hy. Comn., Helena, ROADS,

Mont.—**Goodfellow Brothers, Inc.**, P.O. Box 598, Wenatchee, Wash., CA **$4,085,436**, grade gravel, surface 5.275 mi. Interstate 90 east of Bozeman; 335 ft. overpass; 113 ft. concrete bridge; 128 ft. interchange, Gallatin Co.;

Mont.—**Richardson Constr. Co.**, 19 South Ninth St., Miles City, Mont., CA **$849,261**, grade, gravel, surface 4.69 mi. through Glasgow; 2.07 mi. Glasgow-Opheim Rd., Valley Co.;

Mont.—**Gus N. Albert**, P.O. Box 416, Miles City, Mont., CA **$566,397**, grade, gravel, surface 9.23 mi. near Circle Dawson Co.;

Mont.—**S. Birch Inc. & S. Birch & Sons Constr. Co.**, 1002 15th St. North, Great Falls, Mont., CA **$636,633**, grade gravel, plant mix surface 1.25 mi. Interstate 15; 242.5 ft. interchange; 241.5 foot grade separation, Lewis & Clark Co.;

Mont.—**C. B. Lauch Constr. Co.**, 104 Fourth St. North, Great Falls, Mont., CA **$300,716**, grade, gravel, cement surface 0.51 mi. Lyndale Ave., Lewis and Clark Co. Grand total $6,438,443. BA 5/24/61, CA 5/24/61. CD 5/8/61.

▲† **Foley Bros., Inc. and The Holland Constr. Co.**, New York Bldg., St. Paul, Minn., LB **$7,917,170**, prime contract, FONTENELLE DAM, 35 mi. northeast of Kemmerer, Green River, Seedskadee Reclamation Proj. DC 5570, WYOMING. Bureau Reclamation, Dpt. Interior, Council Chambers of City Hall, Rock Springs, Wyo. BA 5/25/61. CD 4/11/61.

BUILDINGS—LB & CA

▲ **Alport-Hitt, Inc.**, Interstate Hy. 70, St. Charles, Mo., Owner Builds, Total cost **$4,000,000** (3 Year Program) 1st Year $1,000,000, 650 RESIDENCES, Subdivision, incl. park and recreational area, swimming pool, etc., shopping center, Interstate Hy. 70, ST. CHARLES, MO.

▲ **Cain & Cain**, 4001 South Expressway, Fort Worth, Tex., LB **$2,822,586**, general contract, MATERNITY HOSPITAL and ansillary facilities, FORT WORTH, TEX. Harris Hospital, 1300 W. Cannon St., Fort Worth, Tex. BA 5/25/61, CD 5/17/61;

Beals Plumbing & Heating Co., Box 11421, Fort Worth, Tex., LB **$1,282,000**, MECHANICAL CONTRACT for Harris Maternity Hospital, (Fort Worth, Tex.);

General Engineering Corp., 2605 Cullum, Fort Worth, Tex., LB **$498,851**, ELECTRICAL CONTRACT, for Harris Maternity Hospital, (Fort Worth, Tex.).

▲ **Bill Tucker**, c/o Monarch Lumber Co., 3306 Wenoak St., Wichita Falls, Tex., Owner Builds, **$7,146,700**, 659 brick veneer DWELLINGS, Lynwood Addn., WICHITA FALLS, TEX.

▲† **Nelse Mortensen, Inc.**, 1021 West Lake Ave., Seattle, Wash., CA **$3,281,416**, 200 unit CAPEHART HOUSING No. 3, Glasgow Air Force Base, GLASGOW, MONT. Base Procurement Office, P.O. Box 5000, Glasgow, Mont. BA 3/28/61. CD 4/5/61, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., San Diego**—BA 7/6—City, Purchasing Agent, Rm. 161, Civic Center Bldg., Zone 1, PUMP STATIONS Nos. 1 & 2, Metropolitan Sewer Proj. $4,620,000. Plans deposit $25. CD 11/15/60.

▲ **CALIFORNIA**—BA 7/11—State Div. San Francisco Bay Toll Crossings, 151 Fremont St., San Francisco, BRIDGE,

4½ mi. four lane concrete trestle to replace easterly portion of present two lane San Mateo-Hayward Bridge (2nd major stage). $19,000,000. CD 10/6/59.

△† **Utah, Hill Air Force Base**—BA 7/6—U. S. Eng., 180 New Montgomery St., San Francisco, Calif., constr. 5 MISSILE DISASSEMBLY ASSEMBLY BLDG. S.; MODIFICATIONS 12 existing IGLOOS for missile storage; MODIFICATION 2 existing BLDGS. to provide missile component shops, etc., Hill Air Force Base, Davis Co., ENG-04-203-61-360. Approx. $3,100,000. CD 5/19/61.

BUILDINGS—BA

▲ **Wash., Spokane**—BA 6/21—School Dist. No. 81, W. 825 Trent Ave., nine 1 and 2 story, 202,000 sq. ft., steel, rein.-con. HIGH SCHOOL BLDGS. $3,000,000. Plans deposit $100. McClure & Adkison, Sherwood Bldg., archts. CD 4/2/59.

▲ **Calif., Los Angeles**—BA 7/7—University of California at Los Angeles, 405 Hilgard Ave., 6 story rein.-con. PHYSICS BLDG., Unit No. 2. $4,500,000. Plans deposit $400. CD 5/23/61.

HEAVY CONSTRUCTION—LB & CA

▲† **Fluor Corp. Ltd.**, 2500 Atlantic Blvd., Los Angeles, Calif., CA **$35,645,500**, TITAN CONSTRUCTION, Phase II Davis Monthan Air Force Base, TUCSON, ARIZ., U. S. Eng., Ballistic Missile Construction Office, 5651 West 96th St., Los Angeles, Calif., BA 5/19/61. CD 4/19/61.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, ROAD,

R. E. Hazard Contg. Co. & W. F. Maxwell Co., P.O. Box 3217, San Diego, Calif., CA **$7,363,693**, grading, paving to constr. 1.8 mi. eight lane freeway on US Hy. 101 between Market St. and Park Blvd., San Diego, San Diego Co. BA 5/18, CA 5/26. CD 5/24/61, under LB.

BUILDINGS—LB & CA

▲ **Bechtel Corp.**, 220 Bush St., San Francisco, Calif., CA **$43,155,000**, 310,000 kilowatts STEAM ELECTRIC GENERATING STATIONS, Unit 3, Etiwanda Ave. Power Plant, FONTANA, CALIF. Southern California Edison Co., 500 W. 5 St., Los Angeles, Calif. CD 5/23/61.

▲ **Guy F. Atkinson Co.**, Box 259, Long Beach, Calif., CA Est. **$20,000,000**, 35 story, 615,000 sq. ft. aluminum, glass and marble OFFICE, incl. 14 level parking area, 6th and Hill Sts., LOS ANGELES, CALIF. David Shussett, Inc., 333 W. 6 St., Los Anglese, Calif. Charles Luckman Assoc., 9220 Sunset Blvd., Los Angeles 46, Calif., archts. CD 8/15/60.

▲ **Williams & Burrows, Inc.**, 500 Harbor Blvd., Belmont, Calif., CA **$7,000,000**, WHOLESALE FOOD TERMINAL, Port of Oakland Industrial Park, OAKLAND, CALIF. Food Terminal Properties, Inc., c/o contractor. Confer, Willis & Anderson, 366 40 St., Oakland, Calif., archts. CA 5/11.

▲ **Perini Corp.**, 255 California St., San Francisco, Calif., CA **$15,000,000**, Phase I, GOLDEN GATEWAY REDEVELOPMENT, 22 story, 420 units, rein.-con., 3 parking levels, two point type 25 story towers, 38 2 story row houses, SAN FRANCISCO, CALIF. San Francisco Redevelopment Agency, c/o Exec. Dir., 525 Golden Gate Ave., San Francisco, Calif. Wurster, Bernardi & Emmons, De Mars & Reay, Anshen & Allen, John Carl Warnecke & Assocs., 111 New Montgomery St., San Francisco, Calif., archts. H. J. Brunnier, 55 New Montgomery St., San Francisco, Calif., engr. CD 10/11/60.

▲ **Williams & Burrows, Inc.**, 500 Harbor Blvd., Belmont, Calif., LB **$3,716,000** (6 bidders), four 1 story, 182,000 sq. ft. Crestmoor HIGH SCHOOL, two swimming pools, San Bruno, SAN MATEO, CALIF. San Mateo Union High School Dist., 650 N. Delaware, San Mateo, Calif. BA 5/23. CD 5/8/61.

CANADA

BUILDINGS—BA

▲ **Que., Montreal**—BA 6/15—The Forty-Three Hundred 4300 Western Ave., Westmount, 11 story, concrete brick, rein.-con., air conditioned CRUCIFORM EAST WING APARTMENT EXTENSION. $5,000,000. Rueben Fisher, 3177 St. Sulpice Rd., Montreal, archt. Morris Levis, 1410 Guy St., Montreal, Que., engr. CD 5/19/61.

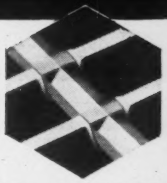
▲ **Newfoundland, Baie Verte**—BA 7/3—Advocate Mines Ltd., 300 Bay St., Toronto, Ont., Patino of Canada Ltd., 55 Yonge St., Toronto, Ont., Canadian Johns Manville Co., Ltd., 310 Victoria St., Montreal, Que., Amet Corp., and Fianciere, Belge de L'Asbestos-Ciment, first phase WHARF SERVICE ROAD, SERVICE BLDG., GARAGE, at mill site, stripping, grading mill site, for Asbestos Ore Development, Total cost $18,000,000. Surveyer, Nenniger & Chenevert, 1440 St. Catherine St. W., Montreal, Que., engrs. CD 2/13/61.

BUILDINGS—SLC

▲ **Sask., Saskatoon**—Sisters of Charity (Grey Nuns) Saskatoon, soon lets contract 322 bed, rein.-con., brick, St. Pauls HOSPITAL. $6,000,000. Green, Blankstein, Russell Assocs., 322 Osborne St. N., Winnipeg, Man., archts. CD 5/3/61.

HEAVY CONSTRUCTION—LB & CA

▲ **J. A. Jones Constr. Co. (Canada) Ltd.**, 277 Slater St., Ottawa, Ont., CA **$3,699,400**, (8 bidders), Contract 4, SEWAGE, incl. PRIMARY and DIGESTION TANKS, SLUDGE LAGOONS, related structures, OTTAWA, ONT. City, City Hall, Ottawa, Ont. BA 5/2/61. CD 5/18/61, under LB.



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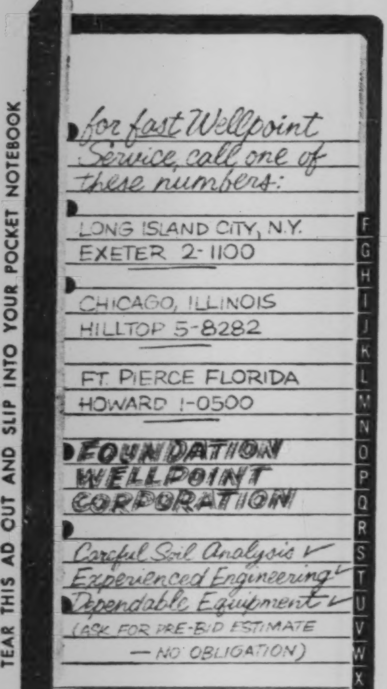

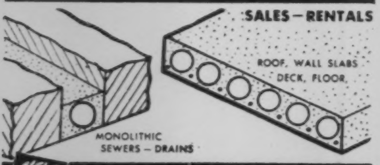

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BUILDINGS—LB & CA

▲ **Anglin-Norcross Ontario Ltd.**, 224 Davenport Rd., Toronto, Ont., CA Est. **$4,475,000**, (11 bidders), 1, 2 and 6 story, exposed rein.-con. ribbing with inset brick panel air conditioned three section CHEMISTRY BLDG. WINGS, St. George St., TORONTO, ONT. University of Toronto, Simcoe Hall, Toronto, Ont. BA 5/10/61. CD 4/28/61.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Argentina**—BA 7/26—Departamento General de Irrigacion, Calle Barcala esq. Espana, Mendoza, Provincia de Mendoza, Segment III, of the general San Martin CANAL, Mendoza River. $4,000,000. Plans deposit $24.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **N. J., Middletown**—Middletown Twp., Municipal bldg., SEWERAGE SYSTEM. **$9,000,000.** Chas. J. Kupper, Municipal Bldg., consult. engr.

EARTHWORK. WATERWAYS

▲ **California**—Turlock and Modesto Irrigation Districts, 117 W. Main St., Turlock, plans by Bechtel Corp., 537 Market St., San Francisco, Zone 5, new Don Pedro DAM, Tuolumne River, Tuolumne Co. **$75,000,000.** **(Correction**—Owner and Engineer's address.) CD 10/17/57, under Calif., Turlock, and CD 4/24/61, under Calif., San Francisco.

▲ **Calif., Marysville**—Yuba County Water Agency, c/o Bd. Supervs. Yuba Co., Courthouse, Marysville, voted $185,000,000 bonds May 15, five DAMS, three POWERHOUSE 10.4 mi. main canals, 40.8 mi. tunnel excav., 11,800,000 cu. yd. open excav., 20,800,000 cu. yd. permanent embankment, 240,000 cu. yd. concrete and 15,900,000 lbs. steel reinforcement, Yuba River Proj., Yuba Co. **$151,270,000.** International Engineering Co., Inc., 74 New Montgomery St., San Francisco 5, Calif., consult. engrs. Bids about two years. CD 5/12/61.

▲ **Fla., Miami**—Dade Co. Bd. P. Instruction, 1410 N.E. 2nd Ave., Dade County Junior College, about 70 acres in N.W. section. **$4,000,000-$5,000,000.**

▲ **Ind., Indianapolis**—Indianapolis Bd. Flood Control, City Hall, ½ mi. wide, 4 mi. long RESERVOIR, extending along Eagle Creek from dam near 38th and Dandy Trail north to Traders Point. Over **$3,000,000.** Dodson, Kinney & Lindblom, 5 E. Long St., Columbus, O., consult. engrs.

▲ **Wis., Milwaukee**—Metropolitan Sewerage Comn. of the County of Milwaukee, P.O. Box 2079,
EARTH and CONCRETE IMPRVS., Honey Creek, West Allis, Wauwatosa and Milwaukee, **$4,000,000.**
EARTH and CONCRETE IMPRVS., Underwood Creek, Wauwatosa, **$2,350,000.**
IMPRV. Root River, South Milwaukee, Oak Creek, Franklin and West Allis, **$7,500,000.**
IMPRV. Oak Creek, Oak Creek, P.O. South Milwaukee, **$6,000,000.**
EARTH and CONCRETE Kinnichinnic River, Milwaukee, **$3,175,000.**
EARTH and CONCRETE IMPRVS., Lincoln Creek, **$2,100,000.**
IMPRV. Menomonee River, **$500,000.**

UNCLASSIFIED

▲ **Texas**—South Texas Electric Cooperative, Gonzales, 833 mi. ELECTRIC POWER TRANSMISSION LINES, **$3,933,000;** 18 electric sub-stations, **$3,750,000,** Goliad area.

PUBLIC BUILDINGS

▲ **Calif., Los Angeles**—University of California at Los Angeles, 405 Hilgard Ave., plans by Neptune & Thomas & Assoc., 742 Colorado Blvd., 6 story, 2 bsmnt., 150,000 sq. ft. rein.-con. PHYSICS, Unit No. 2. **$4,500,000.**

▲ **Calif., San Diego**—Bd. Supervs. San Diego County, Civic Center Bldg., Zone 1, plans by Tucker, Sadler & Bennett, 2718 Fifth Ave., Zone 3, 300,000 sq. ft. COUNTY OPERATIONS CENTER, Kearney Mesa. **$3,000,000.** Constr. next year.

▲† **Ga., Fort Benning** — U. S. Eng., P.O. Box 889, Savannah, plans by Abreu & Robeson, Inc., 141 Walton St., N. W., Atlanta, 1 story, 515,000 sq. ft. ACADEMIC BLDG., (USAIC), **$10,000,000.** Chastain & Tindel, 165 Alexander St., N. W., Atlanta, consult. engrs. Lazenby & Borum, 40 16th St., N. W., Atlanta, struct. engrs.

▲ **Mo., Cape Girardeau**—Cape Girardeau Housing Auth., City Hall, plans by E. E. Butler & Assocs., P.O. Box 853, Columbia, 220-unit low rental PUBLIC HOUSING, between Elm and Hickory Sts. **$3,000,000.**

▲ **Mo., Columbia**—Curators of University of Missouri, 116 Jesse Hall, Zone 14, 3 story MEDICAL SCIENCE ADDN. and CORRIDOR connecting with new Research Addns. to Teachers College on Campus. **$3,197,500.**

▲ **N. J., Woodbridge**—Bd. Educ. Woodbridge Twp., Barron Ave., referendum bonds and project June 6 indefinitely postponed SENIOR HIGH SCHOOL, Iselin, **$3,000,000,** Wiedersum Assoc., 65 Roosevelt Ave., Valley Stream, N. Y., archts.; referendum bonds and project June 6 indefinitely postponed HIGH SCHOOL ADDN., **$500,000.** Merchant Seidel & Hickey, 1 Elm Row, New Brunswick, archts. CD 5/2/61.

▲ **N. Y., Hornell**—Hornell Consolidated School Dist., voted **$4,350,000** bonds, HIGH SCHOOL, 2 ELEMENTARY SCHOOLS and SCHOOL ADDNS. CD 1/30/59.

▲ **N. Y., New York**—Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City, Proj. E-514, P.S. 153, vicinity of Amsterdam Ave. and W. 145 St. **$3,600,000.** Site acquisition 1962. CD 1/25/60.

▲ **N. Y., New York**—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Proj. E-541, P.S. 185 vicinity 7 Ave. and 115 St. **$3,600,000.** Site acquisition 1962. CD 1/25/60.

▲ **N. Y., New York**—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, Proj. E-594 JUNIOR HIGH SCHOOL 201, North Harlem Ave. east of 5 Ave., north of 125 St. **$4,100,000.** Constr. 1962. CD 1/9/61.

▲ **Pa., Allentown**—Lehigh Co., Court House, voted bonds May 16, COURT HOUSE. **$5,000,000.**

▲ **Utah, Farmington**—Davis County School Bd., Farmington, voted bonds May 16, SCHOOLS. **$4,500,000.** CD 7/11/57.

COMMERCIAL BUILDINGS

▲ **Calif., San Francisco**—Eichler Homes, Inc., 2151 St. Francis Dr., Palo Alto, plans by Claude Oakland, 109 Stevenson St., HOUSING DEVELOPMENT, Diamond Heights. **$3,500,000.**

▲ **Ill., Chicago**—Presbyterian-St. Luke's Hospital, 1753 W. Congress St., 10 story HOSPITAL ADDN., over Health Center, Paulina and Harrison Sts. **$6,500,000.** CD 10/8/56.

▲ **Mo., St. Louis County**—Stix, Baer & Fuller Co., 601 Washington Ave., St. Louis, Zone 1, DEPARTMENT STORE, incl. parking areas, etc. Over **$3,000,000.** Bids probably in 1962.

▲ **N. Y., New York**—Country Squire Motor Inns, 300 Park Ave., Zone 22, N. Y., plans by Kahn & Jacobs, 2 Park Ave., Zone 16, 21 story Country Squire MOTOR INN, entire block W. 51 to W. 52 Sts., Broadway and Seventh Ave. **$14,000,000.** Jaros, Baum & Bolles, 730 Third Ave., Zone 17, mech. engrs. Wayman C. Wing, 411 7 Ave., Zone 1, structur. engr. CD 5/18/61.

▲ **N. Y., New York**—Frouge Corp., 680 5 Ave., Zone 22, plans by Anthony Pavia, 141 North Ave., Bridgeport, Conn., 25 story OFFICE, 600-606 Madison Ave., E. 65 St. **$4,380,000.**

▲ **N. Y., New York**—Frouge Constr. Co., Inc., 141 North Ave., Bridgeport, Conn., plans by Emory Roth & Sons, 400 Park Ave., Zone 22, APARTMENT, Madison Ave. and E. 58 St. **$6,000,000.** To go ahead 1961. **(Correction**—architects.) CD 10/24/60.

▲ **O., Parma**—Budziak, DeGraeve & Kapral Builders, 2711 Pleasant Valley Rd., Cleveland, Zone 34, 216 HOMES, Digwood Estates (four to five year program) **$7,000,000.** CD 2/29/60.

▲ **O., Toledo**—Administrator, St. Vincent's Hospital, Cherry St., 150-bed wing HOSPITAL ADDN. **$5,500,000.** CD 8/16/57.

▲ **Tex., Dallas**—Exchange Park Co., c/o Wm. Blakley, 200 Exchange Park, plans by Lane-Gamble & Associates, 601 Braniff Bldg., 15 story MEDICAL BLDG., 9 story, 250,000 sq. ft., 150 bed HOSPITAL, 100,000 sq. ft., 4 level mall connecting hospital and 65,000 sq. ft. medical bldg., S.W. corner Exchange Park. **$15,000,000.** CD 7/13/55.

▲ **Tex., San Antonio**—Dr. Daniel Gevinson, Developer, c/o Walter Lehr, Jr., 1519 Alamo Nat'l. Bld., plans by John Hans Graham & Associates, 2000 K St. N. W., Wash., D. C., multi-story luxury APARTMENT, Navarro and St. Mary Sts., **$8,500,000;** AUTO PARKING GARAGE, Navarro and St. Marys Sts., **$300,000;** HEATED SWIMMING POOL, Navarro and St. Mary's Sts., **$175,000.** Bernard J. Shaw, 37 Washington St., Morristown N. J., proj. engr. CD 4/12/61.

▲ **Va., Richmond**—Ralph E. Bush, c/o Olin A. Rogers, Travelers Bldg., 15 story, 149-unit APARTMENTS, 12 acre site, Locke Lane, Windsor Farms section. **$3,500,000-$4,000,000.** CD 5/18/61, under Olin A. Rogers, as owner.

▲ **Wis., New Berlin**—Francis Schroedel, 206 E. Hampton Rd., Milwaukee, COMMERCIAL DEVELOPMENT PROJECT, incl. STORES, MOTEL, APARTMENT, HOSPITAL, 1,500 HOMES. **$18,000,000.**

INDUSTRIAL BUILDINGS

▲ **Calif., Fontana**—Southern California Edison Co., 601 W. 5 St., Los Angeles, third STEAM ELECTRIC GENERATING UNIT, Etiwanda Steam Plant. **$43,155,000.** Constr. to start in August.

▲ **Calif., Fresno**—Spreckels Sugar Co., 2 Pine St., San Francisco, SUGAR PROCESSING PLANT near here. **$16,000,000.**

▲ **Ga., Augusta**—Procter & Gamble Co., 6th and Sycamore Sts., Cincinnati, O., synthetic detergent mfg. PLANT, **$4,000,000.** Harry Weaks, Mar Bldg., Vine St., Bernard, O., consult. engr. Bids late 1961.

▲ **Ill., Joliet**—Phoenix Mfg. Co., Industry Ave., ROLLING MILL for steel making addn. to plant Industry Ave., **$9,000,000.**

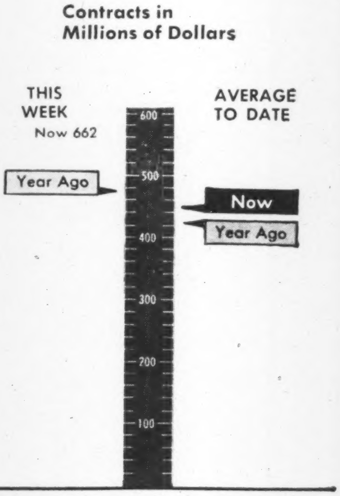
▲ **Iowa, Fort Dodge**—Flintkote Co., 1127 Park Sq. Bldg., Boston, Mass., building materials processing PLANT, southeast of here. **$6,000,000.**

▲ **Tex., Goliad**—South Texas Electric Cooperative, Gonzazles, ELECTRIC STEAM GENERATING PLANT, **$6,750,000;** ELECTRIC PLANT REPAIR SHOP. **$250,000.**

(Proposal Advertisements see pp. 69 to 72)

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

Contracts Awarded In 50 States By Type	This Week (millions)	Cum. 23 wks 1961 (millions)	Chge '60-'61 %
All Heavy Construction	$662.0	$9,600.2	+ 3†
By Ownership			
PRIVATE	299.1	4,889.9	— 2†
PUBLIC	362.9	4,710.3	+ 8
State & Municipal	243.4	3,587.2	+ 7
Federal	119.5	1,123.1	+11
By Type of Work			
PUBLIC			
Waterworks	12.2	168.6	—16
Sewerage	22.9	822.9	+32
Bridges*	17.0	251.3	—33
Highways	123.6	1,598.3	+15
Earthwork, Dams & Waterways	36.2	389.3	+19
Buildings:			
Excl. Housing	77.4	1,102.1	+ 8
Housing	21.1	338.8	+48
Unclassified	52.5	539.0	— 7
PRIVATE			
Buildings:			
Mass Housing	147.4	2,175.8	—12†
Commercial	94.2	1,113.6	+16
Industrial	45.4	1,390.8	+26
Unclassified	12.1	209.7	—54

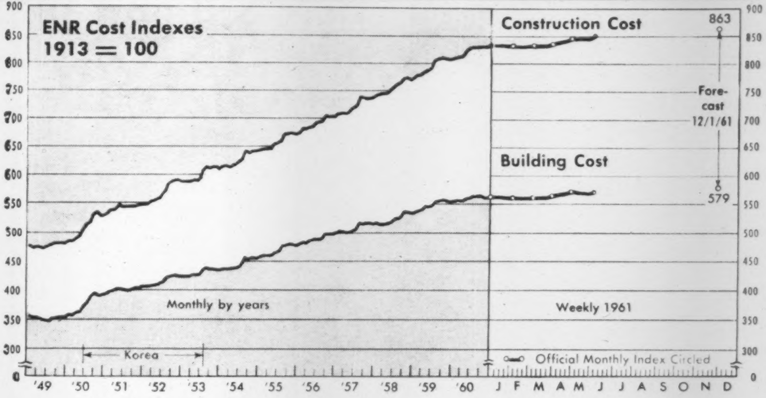
* Includes Private bridges

† April '60 Mass Housing total revised, see footnote to contract table p. 67.

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of June 1 (millions)	Cum. 22 wks 1961 (millions)	Chge '60-'61 %
Corporate Securities	$26.2	$1,524.3	+35
State and Municipal:			
All Except Housing	139.9	2,743.4	— 2
Housing	0	31.3	+130
Federal Loans	5.1	99.8	+44
Federal Aid	0	0	—100
Total Nonfederal	$171.2	$4,398.7	—35
Federal Appropriations:			
Projects in U.S.	0	1.0	—99
Outside U.S.	0	0	—100
Total New Capital	$171.2	$4,399.7	—37



ENR INDEXES (1913 = 100), 20-cities' average	Week of June 1 1961	% Change from Apr. 27 1961	% Change from June 2 1960
Construction Cost	850.38*	+0.4	+2.9
Building Cost	570.17*	+0.2	+1.6

*Official Monthly Index for June, 1961

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

This Month . . .

WAGE RATES, 20-cities' average	June 1961	% Change from May 1961	% Change from June 1960
Common	$2.836	+0.7	+4.8
Skilled (average 3 trades)	4.197	+0.8	+4.4
Bricklayers	4.407	+0.8	+3.8
Structural Ironworkers	4.251	+0.6	+5.5
Carpenters	3.931	+1.1	+4.1
Equipment operators (average three types)	3.822	+0.8	+5.9

MATERIAL PRICES, 20-cities' average	June 1961	% Change from May 1961	% Change from June 1960
Structural Steel (average 3 mills), per cwt	5.50	0	0
Lumber, 2x4 Fir, per M fbm	117.93	−1.0	−2.0
Lumber, 2x4 Pine, per M fbm	109.20	−0.9	−1.7
Cement, bulk, per bbl	4.04	0	+0.7
Sand, per ton	2.355	+0.6	−4.6
Ready-mixed concrete, per cu yd	14.23	+0.2	−0.5
Gypsum sheathing, ½"x2'x8', per Msf*	62.32	+0.1	−0.9
Fiber board sheathing, ½" sq. ed., per Msf*	70.66	0	−3.3
Mineral wool insulation, 3' batts, per Msf*	67.41	0	−1.8
Crushed stone, 1½", per ton, CL	2.711	+0.1	+1.7
Concrete blocks, sand/gravel, 8"x8"x16", each*	0.2263	0	−2.6

Latest Month . . .

	May 1961	Apr. 1961	May 1960
Brick, common per M	41.15	+0.2	+1.4
Lime, hydrated finishing, per ton, CL	39.68	0	+0.8
Structural clay tile, 3x12x12", per M, 2,000 up*	193.09	0	+2.6
Vitrified clay sewer pipe, std 12", per ft	1.451	0	+1.0
Concrete sewer pipe, 12", per ft	1.421	−0.08	−1.8

* Delivered, trucklots

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
1960	1913 = 100	1949 = 100	1913 = 100	1949 = 100	1913 = 100	1949 = 100
Apr	814.78	170.80	555.98	158.04	695	201
May	822.58	172.44	559.57	159.06	610	176
June	826.64	173.29	561.02	159.48	784	227
July	829.33	173.85	562.63	159.93	682	197
Aug	830.18	174.03	562.17	159.80	631	182
Sept	830.92	174.19	562.79	159.98	603	174
Oct	829.58	173.90	561.45	159.60	591	171
Nov	830.09	174.01	561.11	159.50	609	176
Dec	830.61	174.12	561.50	159.61	503	145
1960 Average	**823.55**	**172.64**	**559.43**	**159.02**	**597**	**172**
1961						
Jan	834.32	174.90	562.91	160.01	557	161
Feb	834.27	174.89	562.93	160.02	464	134
Mar	834.16	174.87	562.89	160.01	519	150
Apr	837.58	175.59	565.19	160.66	598	173
May	847.32	177.62	568.99	161.74	609	176
June	850.38	178.28	570.17	162.07	...	...

engine power

BY CATERPILLAR

Here's a new profitable combination

900
GARDNER-DENVER

Caterpillar-powered Gardner-Denver "Rota-Screw" portable air compressors reduce maintenance to lowest costs ever

Here is a major breakthrough in performance which means new low costs to users of compressed air. Gone are rotary blades or pistons. A helical "Rota-Screw" now eliminates blade chatter, vibration and whine. Quietness, pulsation-free air and minimum maintenance are the results.

Gardner-Denver's new SP900, a 900 CFM machine, is powered, as standard equipment, by the Cat D343 Diesel Engine. The SP600, a 600 CFM machine, is standard with the Cat D333 Diesel Engine. You get four-cycle design with full-stroke efficiency, plus full-length, watercooled cylinder liners for efficient cooling. Aluminum alloy pistons give low reciprocating weight, valve rotators distribute valve face wear and low-friction aluminum alloy bearings are known for superior strength and load carrying ability.

You'll like the Cat-powered Gardner-Denver line for the Caterpillar fuel system that provides "constant power" with *no* adjustments. Low-cost, high BTU fuels, such as household furnace oil, can be used instead of premium-cost No. 1 diesel fuel. Single orifice injectors and precombustion chamber design prevent fouling, even during long periods of idling between air demands. Electric glow plugs and ether starting arrangement are standard for quick, sure starts at below zero temperatures. Compressors are tested for a temperature range of —40° F. to 115° F.

Compressor service is available through a world-wide network of Gardner-Denver service points. In the U. S. alone there are over 5100 Caterpillar Dealer field service trucks on 24-hour-a-day call for engine service.

For more information on this new concept in compressors, write to the Gardner-Denver Company, Quincy, Illinois. Your nearby Caterpillar Dealer can tell you more about Cat Diesel and Natural Gas Engine Power for every application requiring from 50 to 950 HP, or write to Department 516, Engine Division, Caterpillar Tractor Co.

CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

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Private Volume Registers Strong Gain

Private construction contracts awarded in May hit $1 billion, the first billion-dollar total for any month since last October. Public work, however, slipped sharply below April's total and that of one year ago.

The dip in public works offset the rise in private works, thereby dropping total volume of heavy construction contracts 4% below April to $1.8 billion. The total also dropped 1% below May 1960, the third time this year that volume fell below last year.

For the five months, total volume of contracts stands at $8.5 billion.

The growing strength in the private sector of construction provides the surprise in this spring's construction market. May's $1-billion total topped April by 18% and one year ago by 11%. In the January-May period, private contracts of $4.4 billion were 2% above the same period last year and the highest since 1956. The rise in private work moved to planning boards in May indicates the upward trend of private construction will continue.

In contrast to acceleration in private construction, public works moved slower than expected despite federal and state efforts to prod public construction. May awards slumped 19% below April, with even sharper declines in highways, bridges, earthwork and waterworks. The May total of $787 million is also 13% below a year ago. Volume for five months is $4.2 billion.

State and municipal construction accounted for most of the sluggishness in public work, reflecting the big drop in roads contracts in May.

State and municipal awards of $607 million in May was close to the year's slowest contracting pace. It is 22% below the spring high in April, and 14% below a year ago. The $3.2-billion total in the first five months is only 6% above last year, compared to a spread of 11% in the first four months.

Federal contracts dropped 7% in May to $180 million. The five-month total of $967 million is 6% ahead of last year.

Industrial building is the sleeper in this year's construction market. A downtrend that followed a big January reversed itself in April and May, bringing the five-month total to $1.3 billion, a 25% jump over a year ago.

Commercial building may prove another sleeper. It steadily piled up volume since its January low. May's volume of $249 million was the best this year.

A New Record: Who Needs It?

Building and construction costs hit all-time highs this month, sparked by wage increases. ENR's 20-Cities Construction Cost Index reads 850.38, the Building Cost Index 570.17. Both are based on 1913 as 100.

The Construction Cost Index was pushed by laborers' wage boosts of 15 cents hourly in Cleveland, 10 cents in Philadelphia and 20 cents in Chicago.

The Building Cost Index rise was powered by boosts in carpenters rates of 20 cents an hour in Boston, 16½ cents in Philadelphia and 5 cents in Cincinnati, all under new agreements. Deferred boosts hitting the index included, 12 cents for carpenters in Detroit, 15 cents for those in San Francisco and 17 cents for those in Chicago. Bricklayers in New York and Chicago got deferred boosts of 21 cents and 17½ cents respectively. Structural ironworkers in Chicago and Baltimore got boosts of 20 cents and 12½ cents respectively.

Only bright spot in the cost picture this month is the lumber market. ENR's U.S. averages of prices contractors pay for Douglas fir and southern pine 2x4s are down 1% to $117.93 for fir and $109.20 for pine.

Engineering Construction Contracts for May

Four Weeks—Thousands of Dollars (000 Omitted)

	May, 1961								Five Months U. S. Cumulative			
	New England	Middle Atlantic	South	Mid-West	Mississippi to Rockies	Far West	Total U. S.	% Change '60 to '61	1961	1960	% Change '60 to '61	Canada May 1961
Public Works, Total	**41,576**	**125,500**	**162,546**	**111,746**	**176,747**	**169,137**	787,252	−13	**4,172,894**	**3,948,011**	+ 6	**62,294**
Waterworks	474	1,228	3,006	4,047	6,066	3,902	**18,723**	−41	**149,694**	182,362	−18	1,007
Sewerage	2,998	8,134	10,677	14,142	13,517	8,304	**57,772**	+63	**287,144**	213,215	+35	3,668
Bridges	1,665	3,821	7,438	14,428	6,157	1,712	**35,221**	− 6	**225,884**	351,981	−36	811
Earthwork, waterways	11,500	2,862	5,647	2,420	26,145	24,858	**73,432**	+ 1	**337,881**	288,368	+17	1,320
Streets and roads	6,540	31,560	68,753	36,506	53,886	42,998	**240,243**	−31	**1,414,750**	1,253,106	+13	22,589
Buildings: Residential	3,864	11,943	21,404	8,092	12,814	8,756	**66,873**	+63	**300,759**	203,923	+48	453
Other	10,489	60,354	25,966	26,292	31,954	57,466	**212,521**	−11	**980,382**	930,623	+ 5	25,549
Unclassified	4,046	5,598	19,655	5,819	26,208	21,141	**82,467**	−15	**476,400**	524,433	− 9	6,897
State & Municipal	25,559	113,267	122,459	106,431	120,441	119,182	**607,339**	−14	**3,205,879**	3,037,500	+ 6	49,413
Federal	16,017	12,233	40,087	5,315	56,306	49,955	**179,913**	− 8	**967,015**	910,511	+ 6	12,881
Private, Total	**41,483**	**345,285**	**116,121**	**174,122**	**163,488**	**161,548**	**1,002,047**	+11	**4,365,449**	**4,279,288***	+ 2	**76,500**
Bridges	....	....	....	....	....	....	....	−100	**90**	1,499	−94	....
Buildings: Industrial	3,396	106,049	15,109	55,569	40,799	34,369	**255,291**	+ 1	**1,276,690**	1,023,329	+25	15,678
Mass housing	20,042	173,383	51,773	81,815	56,653	66,001	**449,667**	+ 4	**1,923,147**	2,007,446*	− 4	24,336
Commercial	17,570	63,740	46,040	36,421	49,509	35,511	**248,781**	+57	**974,224**	858,053	+14	35,486
Unclassified	475	2,113	3,199	317	16,527	25,667	**48,298**	−22	**191,298**	388,961	−51	1,000
Total, May 1961—4 wks	**83,059**	**470,785**	**278,667**	**285,868**	**340,235**	**330,685**	**1,789,299**	− 1	....	....	....	**138,794**
Total, Apr. 1961—4 wks	93,171	455,833	279,740	289,241	393,968	304,626	**1,816,579**	....	....	....	....	92,388
Total, May 1960—4 wks	122,721	310,038	243,469	329,458	528,451	269,134	**1,803,271**	....	....	....	....	252,925
Five mos. 1961 (21 wks)	**414,197**	**2,069,574**	**1,440,589**	**1,265,565**	**1,935,999**	**1,412,419**	....	....	**8,538,343**	....	+ 4	**588,007**
Five mos. 1960 (21 wks)	522,427	1,903,322	1,149,941	1,442,952	1,919,265	1,289,392*	....	....	....	8,227,299*	....	863,526
%Change '60 to '61	−21	+9	+25	−12	+1	+10	....	....	....	....	....	−32

*** $250 million Callan Park, Calif., mass housing project removed from April '60 statistics because start postponed by rejection of requests for annexation.***

ENGINEERING NEWS-RECORD *reports U. S. (50 states) construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.*

Tulsa Unions Postpone First Pay Boost

Moratorium is an anti-recession move. Unions in other areas forge ahead. Some strikes continue.

A two-year labor contract that calls for no wage increase until the first of next year has been signed by the Associated General Contractors of Tulsa, Okla., and seven building trades unions. The moratorium on pay boosts represents an effort to revive local construction activity that has felt the pinch of recession. A number of workers have suffered from extended layoffs.

Elsewhere, collective bargaining continues to turn out run-of-the-mill long-term contracts and to saddle some areas with long and crippling strikes. A laborers strike in central Connecticut, for example, has stalled over $100 million worth of construction since mid-April.

The Tulsa agreement postpones the effective date of the first pay boost to Jan. 1, 1962, when each of the trades will get a 10-cent increase. Another hike of 10 cents will become due on June 1, 1962.

The unions participating in the moratorium and their present scales are: bricklayers—$4.00; carpenters—$3.45; cement finishers—$3.62; laborers—$2.45; iron workers—$3.67½ and operating engineers—$3.25.

Storm center of the central Connecticut shutdown are the Hartford and New Britain locals of the laborers union. Demands for an exclusive hiring hall and for a subcontractor clause have been major stumbling blocks. The unions have also been seeking a 65-cent wage increase spread over four years and separate welfare funds.

In resisting the hiring hall demand, members of the Hartford General Contractors Association claim it would lead to the "shape-up" procedures used on New York docks and would give union officials too much power. The subcontractor clause, they say, would give them, rather than union business agents, the job of unionizing all workers on a project, including wreckers and landscape workers who are not now generally unionized.

Construction work resumed, however, in southern Connecticut last week when New Haven plumbers, on strike since May 1, withdrew their pickets. The plumbers have been asking for 57 cents in a two-year contract and for a 7-hour day to be achieved by a half hour reduction each year.

Meanwhile, a series of two-year labor contracts has helped pave the way to end an eastern New York shutdown that idled 10,000 workers and tied up $40 million in building projects.

The Eastern New York Construction Employers Association settled with the operating engineers and Albany plumbers and steamfitters on the basis of two-year, 30-cent (15, 15) contracts. Earlier, the contractors negotiated a two-year, 40-cent (15, 25) pact with cement masons, bricklayers and plasterers. Troy plumbers, however, were still on strike last week. And the multimillion-dollar, area-wide shutdown imposed by contractors after the engineers and plumbers struck had not been lifted.

Elsewhere, sheet metal workers and roofers in Akron, Ohio, have accepted three-year contracts giving them 40 cents more in wages and fringe benefits. The first increases are four cents more for health and welfare and 10 cents for pensions.

A new two-year contract with the Seattle, Tacoma and Mountain Pacific chapters of Associated General Contractors gave operating engineers in Seattle and Tacoma, Wash., a 10-cent wage boost and 10 cents more in fringe benefits June 1. Members of the union will get another 20-cent wage increase next June 1. New scales will range from $3.49 for oilers to $4.28 for shovel operators, plus 30 cents for health, welfare and pensions.

At the same time, Akron, Ohio, engineers have settled for a three-year, 45-cent pact that will boost wages 15 cents each year. Final pay increase will make the journeymen's scale $4.16.

New Contract Means Lower Costs

Future home owners in a multimillion-dollar, low- and middle-income housing development in the East Hills section of Pittsburgh, Pa., are expected to enjoy substantial purchase-price savings as a result of a new and unusual project labor agreement.

The agreement was negotiated by the Pittsburgh Building and Construction Trades Council, AFL-CIO, and Catranel, Inc., the general contractor. It seeks to cut building costs by assuring labor peace and by allowing unfettered use of labor-saving tools, new construction methods and prefabricated units.

Work on the Action-Housing, Inc. development is scheduled to start next week and to last four or five years. Between 1,400 and 1,600 housing units, mostly single homes in the $12,000-$16,000 price range, are planned for purchasers with incomes of $5,000 to $8,000.

The new labor agreement, which applies only to work on the development, covers the project's duration. Among its significant provisions are these:

- The contract is binding on all affiliates of the council.
- It contains a subcontractor clause imposing its terms and conditions on all subcontractors. It also has a seven-day union shop clause.
- It bans work stoppages because of jurisdictional disputes. Unresolved disputes over work assignments are to be handled under the National Joint Board procedure.
- The contract gives Catranel and its subcontractors the right "to manage their respective businesses, including the right to decide the machines, tools and equipment to be used at East Hills, as well as construction methods, assembly processes and the right to use factory-fabricated units."
- Although the contract contains no general no-strike clause, the "teeth" for labor peace is a "72-hour" exclusive hiring hall clause. If the unions fail for any reason to refer workers within 72 hours, the contractors can recruit from any source.
- On single and multiple units of less than three stories, workers will be paid 10% below the commercial rates established by their local contracts.
- If a day's work is lost in the week because of weather, it can be rescheduled for Saturday at straight time pay.

Anthony J. Furlan, president of the Building Trades Council, called the concessions contained in the contract "unusual." He said he knew of no similar labor agreement in the city or nation.

Catranel's president, Roland S. Catarinella, estimated that the agreement will cut the cost of low price homes by $1,000 and the cost of higher priced ones by $4,000.

OFFICIAL PROPOSALS

RATE: **The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.**

CLOSING DATE: **Friday 10:30 A.M. for issue dated the following Thursday.**

SEND COPY TO: **Official Proposal Division,**
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: September 5, 1961

Government of Ghana Volta River Project

The Government of Ghana hereby invites sealed bids, which will be publicly opened in Accra on September 5, 1961, for the Work covered by each of the following proposed Contracts:

Akosombo Development

Contract No.
- A-4 Supply of Turbines and Governors
- A-5 Supply of Generators, Transformers and Major Electrical Equipment
- A-6 Supply of Cranes and Hoists
- A-7 Supply of Penstocks
- A-8 Supply of Gates, Trashracks and Rolling Hatch Covers

Transmission System

Contract No.
- L-1 Construction of 161 kv Transmission Lines
- S-1 Supply of Equipment for 161 kv Substations
- S-2 Construction of 161 kv Substations
- S-3 Construction of Warehouses and Personnel Housing

Bids are invited only from firms or associations of firms who are prepared to submit complete Bids for all the Work required by any of the individual Contracts listed above, except that consideration will be given to Bids for Work covered by each separate Schedule of Contract No. A-5. A bidder submitting a Bid for Contract No. S-1 must also submit a complete Bid for Contract No. S-2, and vice-versa, since these two Contracts will be awarded jointly to one firm or association of firms. Bidders may, if they so desire, submit Combined Bids for the performance of a combination of any two or more of the Contracts listed above for the Akosombo Development and/or Transmission System. Each Combined Bid will be considered an indivisible offer to perform all of the Contracts included within the Combined Bid, if this is desired by the bidder and is explicity so stated.

Bids will be considered only from firms whose financial resources, technical ability and experience are commensurate with the Work to be performed under the respective Contracts, who have satisfactorily completed comparable Work on other projects, and who submit with their Bids the preliminary security required for each proposed Contract.

A Bid which does not conform to the Instructions to Bidders may be rejected. The Government reserves the right to reject any or all Bids, and to accept any Bid considered advantageous to the Government.

Contract No. A-4 will include the supply of four (4) Francis-type hydraulic turbines each having a rated output of 176,500 horsepower when operating at 115.4 rpm under a rated net head of 213 feet; and four (4) hydraulic turbine governors; all delivered on the dock at Tema, Ghana.

Contract No. A-5 will include the supply of four (4) generators each rated at 142,000 kva; the generator bus; four (4) three-phase transformers each rated at 165,000 kva and 161 kv; metering, relaying, and control switchboards; and station service load center substations, including 400-volt drawout air circuit breakers; all delivered on the dock at Tema, Ghana.

Contract No. A-6 will include the supply of one (1) powerhouse gantry crane of 500 tons rated capacity; one (1) intake gantry crane of 85 tons rated capacity; four (4) intake gate hoists; and two (2) mobile spillway hoists; all delivered on the dock at Tema, Ghana.

Contract No. A-7 will include the supply of approximately 3,000 tons of fabricated steel 24-foot diameter penstock sections for four (4) complete penstocks and the upper and lower elbows for two (2) additional penstocks and all supporting rings and expansion joints, all fabricated and delivered in Ghana, with an option for the Government to purchase sections for all six (6) penstocks.

Contract No. A-8 will include the supply of approximately 2,500 tons of fabricated steel consisting of slide and wheel gates, gate guides and trashracks for the power intake, draft tubes, and 25-foot diameter diversion tunnel, twelve (12) spillway taintor gates each 42 feet by 38.5 feet; and six (6) rolling generator hatch covers; all delivered on the dock at Tema, Ghana.

Contract No. L-1 will include the supply and construction of approximately 100 miles of double-circuit transmission lines for System I and approximately 400 miles of single-circuit transmission lines for System II, all designed for 161 kv with steel or aluminum towers and all-aluminum conductor.

Contract No. S-1, which must be bid jointly with Contract No. S-2, will include the supply of major electrical equipment for five (5) substations for System I and eleven (11) substations for System II, all with 161 kv primary voltage, including one (1) synchronous condenser rated at 25,000 kva; twenty-three (23) transformers ranging in size from 3,000 to 55,000 kva; fifty (50) circuit breakers for 161 kv service; meter, relay and control switchboards; carrier current supervisory and communication equipment; all delivered on the dock at Tema or Takoradi, Ghana.

Contract No. S-2, which must be bid jointly with Contract No. S-1, will include the construction of the substations referred to in Contract No. S-1 and the installation of the items to be supplied thereunder.

Contract No. S-3 will include the construction of permanent warehouses and personnel housing required in connection with the above-mentioned substations.

Copies of the respective Contract Documents may be obtained by prospective bidders from:

Kaiser Engineers and Constructors, Inc.
(Volta River Project)
Kaiser Center
300 Lakeside Drive
Oakland 12, California

by making a non-refundable payment of U. S. $50 or LG17 17s. 6d. for two sets for each Contract, in the form of a check or money order made payable to Kaiser Engineers and Constructors, Inc.

Bids: Sept. 4, 1961

Republica De Nicaragua Empresa Nacional De Luz Y Fuerza Managua

INVITATION FOR BIDS

TMV HYDROELECTRIC SYSTEM—First Stage

The Empresa Nacional de Luz y Fuerza, an autonomous Entity of the State, Republic of Nicaragua, announces that having obtained financing from the International Bank for Reconstruction and Development and from the Development Loan Fund for the construction of the first stage of the Tuma-Matagalpa-Viejo (TMV) Hydroelectric System, will receive sealed Bids addressed to the Gerencia de Construcción (Construction Management) of the same Entity for the fabrication, supply and erection of the equipment herein described, until the 4th day of September, 1961, at 15 hours, at which time the Bids will be publicly opened and read.

Contract No. IC-6
Project: TMV System—First Stage
Work: Electromechanical Equipment for the Rio Cacao Powerplant.

Copies of the Contract Documents, Drawing and Specifications may be obtained from:

1. Empresa Nacional de Luz y Fuerza, Gerencia de Construcción, Managua, Nicaragua, upon payment of 700 Cordobas for the first set, and 210 Cordobas for each additional set;

2. Electroconsult Engineers, 13 Via Cavallotti, Milan, Italy, upon payment of 100 US Dollars for the first set, and 30 US Dollars for each additional set.

Contract Documents, Drawings and Specifications may be examined at the two above mentioned places, and at:

3. Nicaraguan Embassy in Washington, D.C., U.S.A., 1627 New Hampshire Ave., N.W.;

4. General Consulate of Nicaragua in New York, N.Y., U.S.A., 1720 Ave. of the Americas, Rockefeller Center, Suite 2200.

Each Bid shall be accompanied by a Bid Bond for a sum equal to 5% of the total Bid price.

The general features of the Works are:

Location: about 6 Km west of Jinotega, Department of Jinotega, Nicaragua.

Description:

a. Tunnel inlet trashracks, raking machine, slide gate and wheel gate;

b. A 2.40 m I.D. butterfly valve, with related air valve, overhead crane and minor accessories;

c. A 700 m long, 2.60 m I.D. steel penstock;

d. Two turbine inlet valves, rotary type;

e. Two 25 500 kW, 600 r p m, vertical shaft Francis turbines, 267.50 m rated head, 11 m^3/sec rated flow, with synchronous relief valve and governor;

f. Two 31 500 kVA, 600 r p m, 60 Hz synchronous generators;

g. Medium and low voltage equipment for the complete plant, including station service equipment but excluding power transformers and related substation;

h. Powerhouse overhead traveling crane, 90 t rated capacity;

i. Miscellaneous equipment, including telephone system, cooling water and drainage system, 1-ton elevator and minor items.

Partial Bids for items a) b) c), or for items d) e) f) g) h) i), or comprehensive Bids will be considered; similarly partial Contract may be awarded according to the above mentioned subdivision (Contracts No. IC-3 and IC-5 respectively). Partial Contracts may be awarded to comprehensive Bidders.

Bids: June 26, 1961

The Port of New York Authority Port Authority Building

Preparation of Room and Air Conditioning System for 7070 Computer

CONTRACT O & M 644

Sealed proposals for the installation of an air conditioning system and preparation of a room for a 7070 IBM Computer on the tenth floor of the Port Authority Building will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M. o'clock June 26, 1961, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

June 8, 1961
New York

Read the Official Proposal Column of
ENGINEERING NEWS-RECORD
This Week and Every Week

Bids: June 22, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Canal Law, for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 22nd day of June 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. FULLER, District Engineer, 353 Broadway, Albany, New York						
Rensselaer Rte. 22	FARC 61-85	Petersburg-North Petersburg, S.H. 8059; Stone School House-North Petersburg-Vermont State Line, S.H. 1424 Proj. F-396(5)	2.35	Asphalt Concrete = 2.32 Mi. Misc. Work = 0.03 Mi.	$33,000 Plans $5	$585,000
Saratoga Warren Rte. 9	RC61-82 C61-13	South Glens Falls Village: Saratoga Avenue and Main Street, S.H. 5598; City of Glens Falls: Glen Street Arterial Highway (Hudson River to Oakland Street)	0.28	Asphalt Concrete Reconstruction and Widening of Bridge Deck 736′ Long Prestressed Concrete Beam Bridge, 64.6′ Span	$27,000 Plans $5	486,000
Warren Rte. 8	RC61-97	Riverside-Wevertown, Part 1, S.H. 5055; Bridge No. 1 (Riverside Bridge)	0.06	Bridge Repairs	$3,900 Plans $5	71,000
Washington Rte. 372	RC61-87	Cambridge Village, S.H. 1082	1.02	Asphalt Concrete	$2,500 Plans $5	42,000
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Fulton Rte. 349	RC61-100	Gloversville-Mayfield, S.H. 33; Gloversville-Broadalbin, Pt. 1, S.H. 248; Gloversville-Broadalbin, Pt. 2, S.H. 1935	3.58	Asphalt Concrete Type 1A	$8,000 Plans $5	141,000
Fulton Rte. 29	FARC 61-65	Johnstown-Broadalbin, Pt. 1, S.H. 544; Johnstown-Broadalbin, Pt. 2, S.H. 543 Proj. No. F-340(6)	6.42	Cement Concrete Pavt.=6.38 Mi. Misc. Work = 0.04 Mi.	$100,000 Plans $5	1,833,000
Fulton Rte. 30	RC 61-98	Northville Village: Main Street and Reed Street S.H. 9365	0.49	Asphalt Concrete	$2,000 Plans $5	39,000
Herkimer Rte. 5	RC 61-88	Little Falls-East Creek, S.H. 456 East Creek, S.H. 5159	1.26	Asphalt Concrete Type 1A	$5,500 Plans $5	100,000
Herkimer Rte. 28	RC 61-89	Middleville Village-Newport Village, S.H. 5064; Middleville-Poland, S.H. 461; Poland Village-Coldbrook Village, S.H. 5069	4.34	Asphalt Concrete Type 1A	$13,000 Plans $5	237,000
Herkimer	M-61-8	Days Spillway-Barge Canal-App. ¾ Mi. East of Utica City Line	....	Rehabilitation of Race Behind Spillway Headgate	$2,500 Plans $5	44,500
Oneida Rte. 412 & 12B	RC 61-90	Hamilton College-Clinton, S.H. 1610; Clinton Village-College Street, S.H. 9061; Clinton Village, S.H. 877	0.72	Asphalt Concrete Type 2A	$2,000 Plans $5	35,000
Oneida Rte. 5	RC 61-91	Utica-Oneida Castle, Part 2, S.H. 271; Utica-Oneida Castle, Part 1, S.H. 250; Kirkland-New Hartford, S.H. 9205	3.09	Asphalt Concrete Type 1A	$13,000 Plans $5	240,000
Oneida	M-61-7	New London Spillway	....	Repair Spillway	$1,400 Plans $5	24,500
Oneida	U. S. 105	Lock 22E and Lock 21E in and Near the City of Rome	....	New Approach Slabs, Gates and Misc. Work	5% of Bid Plans $10	Confidential
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington Street, Syracuse, New York						
Cayuga Rte. 104A	RC 61-73	Sterling-Oswego Road, S.H. 685	4.09	Asphalt Concrete Type 1A	$11,000 Plans $5	201,000
Oswego Int. Trg. Rte. 81	FITS 61-16	Interstate Route 505 (Central Square-Parish) FISH 58-26 (Parish-Jefferson County Line, Pt. 1) FISH 59-1 (Parish-Jefferson County Line, Pt. 2) FISH 59-22 Proj. No. I-81-2(29)	20.01	Traffic Signs	$3,300 Plans $5	58,000
Seneca Rtes: 5, 20, 96A	FATS 61-17	Geneva-McDougall, S.H. 8183; Geneva-Waterloo, S.H. 5087; Geneva-Waterloo, Parts 2 & 3, S.H. 8240 Proj. F-U-452(9), U-406(6)	2.69	Traffic Signs and Delineators	$1,500 Plans $5	$26,000
Tompkins Rte. 13	RC 61-72	Ithaca-Varna, S.H. 1867; Ithaca-Dryden, Part 1, S.H. 681 Varna Crossing, S.H. 5225	5.06	Asphalt Concrete Type 1A	$21,000 Plans $5	374,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Genesee Rte. 63	RC 61-99	Alabama-Batavia, Pt. 2, S.H. 1402A; Alabama-Batavia, Pt. 2, S.H. 1402B; Alabama-Batavia, Pt. 2, S.H. 1402	2.95	Asphalt Concrete = 2.82 Mi. Misc. Work = 0.13 Mi.	$19,000 Plans $5	340,000
Genesee Rte. 262	RC 61-22	Elba-Byron, Part 1, S.H. 48-14; Elba-Byron, Part 2, FASSH 48-13; Elba-Byron, Part 3, FASSH 50-6	6.54	Asphalt Concrete	$17,000 Plans $5	301,000
Monroe	M-61-6	East Guard Lock-Erie Canal—Rochester	....	Cleaning and Painting	$400 Plans $5	7,500
Wyoming Rte. 78	FARC 61-2	Java Center-Waldo Corners-Smith Corners, S.H. 1716 Java Center-Java Village, S.H. 894 Proj. F-1158(2)	5.95	Asphalt Concrete = 5.81 Mi. Misc. Work = 0.14 Mi.	$43,000 Plans $5	792,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court Street, Buffalo 2, New York						
Erie Rte. 78	RC 61-76	Transit, Part 1, S.H. 88 Transit, Part 2, S.H. 89	7.00	Asphalt Concrete	$47,000 Plans $5	865,000
Erie Rte. 62	RC 61-101	North Collins-Lawton, S.H. 524 Hamburg-North Collins, S.H. 523	4.87	Asphalt Concrete = 4.78 Mi. Misc. Work = 0.09 Mi.	$31,000 Plans $5	567,000
DISTRICT No. 6, WM. J. DENNIS, District Engineer, 30 West Main St., Hornell, N. Y.						
Steuben Rte. 15	FARC 61-86	Campbell-Bath, S.H. 5224; Bath-Savona, S.H. 754 Proj. F-225(19)	3.02	Asphalt Concrete	$16,000 Plans $5	294,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
Franklin & Jefferson & St. Lawrence Rtes. 3, 177, 87, 186, 56, 37C, 10	RC 61-94	Br. No. 1, S.H. 985A; N.Y.C.R.R. Overhead, Arsenal St. Watertown Arterial: Br. No. 1, S.H. 428; Br. No. 2, S.H. 835; Br. No. 3, S.H. 8418; Br. No. 2, S.H. 1168; Br. No. 2, S.H. 1265; Br. No. 1, S.H. 1587; Br. No. 1, S.H. 1862	....	Cleaning & Painting 9 Bridges	$1,100 Plans $5	20,000
St. Lawrence Rte. 68	RC 61-102	Ogdensburg-Canton, Pt. 1, S.H. 732 Ogdensburg-Canton, Pt. 2, S.H. 733	2.86	Asphalt Concrete, Type 1A	$7,000 Plans $5	124,000
DISTRICT No. 9, J. C. FEDERICK, District Engineer, 71 Frederick St., Binghamton, N. Y.						
Chenango Rte. 23	RC 61-67	Norwich-Plymouth, S.H. 112	4.76	Asphalt Concrete	$15,000 Plans $5	262,000
Delaware Rte. 17B	RC 61-69	Hancock-Long Eddy, Pt. 2, S.H. 8503 Hancock-Long Eddy, Pt. 1, S.H. 5671	5.30	Asphalt Concrete	$14,000 Plans $5	262,000
Otsego Rte. 28	RC 61-68	Milford-Cooperstown, S.H. 5445	6.12	Asphalt Concrete	$12,000 Plans $5	228,000
Sullivan Rte. 42	RC 61-66	Forestburg-Monticello, S.H. 1708	6.72	Asphalt Concrete	$18,000 Plans $5	326,000
Sullivan & Ulster Rte. 209	FARC 61-93	Port Jervis-Wurtsboro, Pt. 2, S.H. 8287 Wurtsboro-Ellenville, S.H. 8080 Proj. No. F-443(5)	8.74	Asphalt Concrete, Type 1A; 1 Br. Corrugated Plate Pipe & Arch, 33.17′ ± SKEW Span; 2 Brs. Comp. WF Beam; 1 Span 100′; 1 Span 84′	$140,000 Plans $5	2,607,000
DISTRICT No. 10, A. M. SARR, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau Rte. 24	FALIE 61-4	Long Island Expressway (Jericho Turnpike-South Oyster Bay Road) Proj. U-862(34)	3.05	Roadside Development	$12,000 Plans $5	210,000
Suffolk Rte. 27A	RC 61-92	Babylon-Bayshore, S.H. 743	2.46	Asphalt Concrete = 2.37 Mi. Misc. Work = 0.09 Mi.	$27,000 Plans $5	489,000

Any projects in this letting that are on the Federal Aid highway system are subject to the provisions of the "Federal Aid Highway Act of 1956," being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifi-

(Continued on opposite page)

OFFICIAL PROPOSALS
(Continued from opposite page)

particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: July 7, 1961

Ascension-St. James Bridge & Ferry Authority

NOTICE TO BIDDERS

Sealed bids will be received by the Ascension-St. James Bridge and Ferry Authority, hereinafter referred to as the Owner, at its offices in Hotel Donaldson, 508 Mississippi Street, Donaldsonville, Louisiana, until 3:00 PM Central Standard Time, July 7, 1961, and immediately thereafter publicly opened and read in the said offices, for the furnishing of all plant, labor, equipment, materials and other facilities and all other things necessary and proper for and incidental to the furnishing, erecting and field painting of the superstructure, comprising all structural steel and miscellaneous metalwork, filled steel grid bridge deck, reinforced concrete bridge deck, curbs and railings, navigation and obstruction lighting and incidental appurtenances for the Mississippi River Bridge located near Donaldsonville, Louisiana, from Station 3938+04 to Station 4029+06, on the substructure provided by others, all as described in plans and specifications prepared by Palmer and Baker Engineers, Inc., Consulting Engineers.

Plans and specifications will be available for distribution and examination on or about May 29, 1961. Said plans and specifications may be examined at the aforesaid office of the Owner and the offices of Palmer and Baker Engineers, Inc., Room 309, California Company Building, 1111 Tulane Avenue, New Orleans 12, Louisiana, 2460 Government Boulevard, Mobile, Alabama, and 2461 Wisconsin Avenue, N. W., Washington, D. C. Complete copies of the foregoing documents will be furnished to bona fide bidders upon request to the Engineer's Mobile office at the above address or P. O. Box 346, accompanied by a deposit of Two Hundred Dollars ($200.00) per set. The deposits, if a bid is made, will be remitted not later than thirty days after the opening of bids, provided the documents are returned complete and in good condition.

A certified check on a National Bank or a Louisiana State Bank in good standing and drawn to the order of the Ascension-St. James Bridge and Ferry Authority in the amount of Seven Hundred Fifty Thousand Dollars ($750,000.00) shall accompany each bid as a guarantee that the bidder, if successful, will enter into a contract and make bond in accordance with the requirements of the specifications. Bidder's bonds, cashier's checks, or currency will not be acceptable.

Attention is called to the fact that after bids are received hereunder, revenue bonds will be offered for sale by the Owner to finance the cost of the work, that the award of work herein advertised will be made promptly, but the award will be contingent on the sale and delivery of said revenue bonds, and that the obligations of the Owner under the Contract thus awarded will be payable solely from the funds derived from the issuance and sale of such revenue bonds.

All bids shall be submitted in sealed envelopes bearing on the outside the name of the bidder, his address and the designation of the work: "Superstructure for Donaldsonville Bridge and Approaches, Donaldsonville, Louisiana." If submitted by mail, the sealed envelope containing the bid, and marked as directed above, shall be enclosed in another envelope addressed to:

Ascension-St. James Bridge and Ferry Authority
Hotel Donaldson
508 Mississippi Street
Donaldsonville, Louisiana

Bids will be received to the hour and date hereinbefore specified, and must be in the Owner's office by that time. No bid tendered later than the time fixed will be accepted and any such bid will be returned to the bidder unopened.

The Owner reserves the right to reject any and all bids and to waive informalities in any bid.

All bids will be retained by the Owner and none will be returned.

The Ascension-St. James Bridge and Ferry Authority will meet in its offices in Hotel Donaldson, 508 Mississippi Street, Donaldsonville, Louisiana, on the date and at the time hereinbefore shown, and will then and there proceed to open and read said bids in public session.

Thus Done and Signed on this 25th day of May, 1961.

For the
Ascension-St. James Bridge and Ferry Authority
Dr. Spencer B. Lake
Chairman

Bids: July 7, 1961

Ascension-St. James Bridge & Ferry Authority

NOTICE TO BIDDERS

Sealed bids will be received by the Ascension-St. James Bridge and Ferry Authority, hereinafter referred to as the Owner, at its offices in Hotel Donaldson, 508 Mississippi Street, Donaldsonville, Louisiana, until 3:00 P.M. Central Standard Time, July 7, 1961, and immediately thereafter publicly opened and read in the said offices, for the furnishing of all plant, labor, equipment, materials and other facilities and things necessary and proper for or incidental to the complete construction of all substructures for the Mississippi River Bridge and approach spans located near Donaldsonville, Louisiana, from and including abutment number 0 (complete with wingwalls) to and including abutment number 1 (complete with wingwalls), having face of backwalls at Stations 3938+04 and 4029+06 respectively; all as described in plans and specifications prepared by Palmer and Baker Engineers, Inc., Consulting Engineers.

Plans and specifications will be available for distribution and examination on or about May 29, 1961. Said plans and specifications may be examined at the aforesaid office of the Owner and the offices of Palmer and Baker Engineers, Inc., Room 309 California Company Building, 1111 Tulane Avenue, New Orleans 12, Louisiana, 2460 Government Boulevard, Mobile, Alabama, and 2461 Wisconsin Avenue, N.W., Washington, D. C. Complete copies of the foregoing documents will be furnished to bona fide bidders upon request to the Engineer's Mobile office at the above address or P.O. Box 346, accompanied by a deposit of Two Hundred Dollars ($200.00) per set. The deposits, if a bid is made, will be remitted not later than thirty days after the opening of bids, provided the documents are returned complete and in good condition.

A certified check on a National Bank or a Louisiana State Bank in good standing and drawn to the order of the Ascension-St. James Bridge and Ferry Authority in the amount of Three Hundred Thousand Dollars ($300,000.00) shall accompany each bid as a guarantee that the bidder, if successful, will enter into a contract and make bond in accordance with the requirements of the specifications. Bidder's bonds, cashier's checks, or currency will not be acceptable.

Attention is called to the fact that after bids are received hereunder, revenue bonds will be offered for sale by the Owner to finance the cost of the work, that the award of work herein advertised will be made promptly, but the award will be contingent on the sale and delivery of said revenue bonds, and that the obligations of the Owner under the Contract thus awarded will be payable solely from the funds derived from the issuance and sale of such revenue bonds.

All bids shall be submitted in sealed envelopes bearing on the outside the name of the bidder, his address and the designation of the work: "Substructure for Donaldsonville Bridge and Approaches, Donaldsonville, Louisiana." If submitted by mail, the sealed envelope containing the bid, and marked as directed above, shall be enclosed in another envelope addressed to:

Ascension-St. James Bridge and Ferry Authority
Hotel Donaldson
508 Mississippi Street
Donaldsonville, Louisiana

Bids will be received to the hour and date hereinbefore specified, and must be in the Owner's office by that time. No bid tendered later than the time fixed will be accepted and any such bid will be returned to the bidder unopened.

The Owner reserves the right to reject any and all bids and to waive informalities in any bid.

All bids will be retained by the Owner and none will be returned.

The Ascension-St. James Bridge and Ferry Authority will meet in its offices in Hotel Donaldson, 508 Mississippi Street, Donaldsonville, Louisiana, on the date and at the time hereinabove shown, and will then and there proceed to open and read said bids in public session.

Thus Done and Signed on this 25th day of May, 1961.

For the
Ascension-St. James Bridge and Ferry Authority
Dr. Spencer B. Lake
Chairman

Bids: June 26, 1961

Department of Water Works City of Dallas, Texas

72-Inch Raw Water Transmission Line Project

Plans and specifications will be available, beginning May 29, 1961, for the construction of 80,926 linear feet of 72-inch concrete pipe line, and appurtenances. The pipe line will lie in portions of three Texas counties—Hunt, Van Zandt and Kaufman, and will have a construction cost of approximately $5,000,000.00.

Bids will be received by the City of Dallas until 1:30 P.M., June 26, 1961, and will be publicly opened and read aloud by the City Council at 2:00 P.M. on the same day. No deposit for the plans and specifications will be required but a $10.00 handling and mailing charge will be made. Plans and specifications may be obtained at the following address:

Dallas City Water Works
301 Municipal Building
Dallas, Texas
Attn: Mr. Russell Cook

For further information call or write either of the following:

1. Forrest & Cotton, Inc, Consulting Engineers
   600 Vaughn Building
   Dallas, Texas
   Attn: Mr. A. Martelli, RIverside 8-2121
2. Dallas City Water Works
   301 Municipal Building
   Dallas, Texas
   Attn: Mr. Russell Cook, RIverside 8-9711, Ext. 349 or Mr. Art Briggs, RIverside 8-9711, Ext. 326

The supervision of construction will be provided by the designing Engineers, Forrest & Cotton, Inc.

Bid, Performance and Payment Bonds will be required.

The right is reserved to reject any and all bids.

Henry J. Graeser
Superintendent,
Dallas City Water Works

Contractors Watch
This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

Bids: June 21, 1961

State of Delaware Delaware State Highway Department

Notice to Contractors

Sealed proposals will be received by the State Highway Department of the State of Delaware until 2:00 P.M. (E.D.S.T.) June 21, 1961, for the following contracts: CONTRACT I-1(21)-1, FEDERAL-AID PROJECTS I-95-1(11) AND I-95-1(18), BASIN ROAD INTERCHANGE, New Castle County. Stabilize, grade, construct 2 major bridge structures 9" Reinf. Conc. Paving and Adjustments to Gas & Water Utilities. (Completion Time 450 Calendar Days). The principal work items are: 550,000 C.Y. Borrow; 6,000 C.Y. Portland Cem. Conc. Pavement; 2,548 C.Y. Portland Cem. Conc. Masonry; 826,000 Lbs. Structural Steel (Approx. Weight); 14,000 L.F. Cast-in-Place Conc. Piles; 370,000 C.Y. Swamp Excavation; 480,000 C.Y. Special Fill. CONTRACT I-1(23), FEDERAL-AID PROJECT I-95-1(15), STABILIZE SOUTH PORTION OF CHRISTINA INTERCHANGE, New Castle County. Excavating Unsuitable Material and Backfilling to Elevation 5.5'. (Completion Time 600 Calendar Days). The principal work items are: 455,000 C.Y. Channel Excavation; 32,000 C.Y. Borrow; 2,150,000 C.Y. Swamp Excavation; 2,750,000 C.Y. Special Fill. CONTRACT I-1(24), FEDERAL-AID PROJECT I-95-1(16), STABILIZE NORTH PORTION OF CHRISTINA INTERCHANGE, New Castle County. Stabilization by use of Sand Drains and Excavation and Backfilling to Elevation 5.5'. (Completion Time 600 Calendar Days). The principal work items are: 1,850,000 C.Y. Borrow; 1,250,000 C.Y. Swamp Excavation, 1,650,000 C.Y. Special Fill; 775,000 L.F. Sand Drains; 160,000 C.Y. Sand Blanket. The Department will also accept bids for a COMBINATION PROJECT which includes all the work contemplated under each of the above listed individual contracts. The Completion Time for the Combination Project is 750 Calendar Days. The major work items for the Combination Project would be: 472,000 C.Y. Channel Excavation; 2,432,000 C.Y. Borrow; 5,828 C.Y. Portland Cem. Conc. Masonry; 3,770,000 C.Y. Swamp Excavation; 4,880,000 C.Y. Special Fill; 775,000 L.F. Sand Drains; 160,000 C.Y. Sand Blanket. PREQUALIFICATION HAS BEEN WAIVED FOR THESE CONTRACTS. Prospective bidders may obtain contract documents from the Highway Department office, Third Floor, Administration Building, Dover, Delaware. Delaware State Highway Department, By: J. Gordon Smith, Chairman., William J. Miller, Jr., Acting Chief Engineer. May 10 1961, Dover, Delaware. BID OPENING HAS BEEN EXTENDED TO JUNE 21, 1961.

District of Columbia—Sewer Construction—Dept. of Sanitary Engineering, Office of the Potomac Interceptor. May 26, 1961. UNIT #3, THE MARYLAND TUNNEL OF THE POTOMAC INTERCEPTOR SEWER, between Anglers Inn and Great Falls, Maryland (Invitation No. C-61136-S), consisting of the following: TUNNEL CONSTRUCTION: 8,500 lin. ft. of 84" concrete sewer in tunnel, including access shafts and vent structures. OPEN CUT SEWER CONSTRUCTION: 625 lin. ft. of 84" dia. reinforced concrete sewer. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, June 22, 1961, EDT, in Room 424, 499 Penn. Ave., N.W.

Bids: July 31, 1961

Trinidad & Tobago Electricity Commission

TENDER

Tenders are invited for the supply of:—
SWITCHGEAR AND STRUCTURES ETC. FOR THE ERECTION OF OUR 33 kV POINT FORTIN SUBSTATION.
Specifications may be obtained on writing to the Purchasing Officer, Trinidad and Tobago Electricity Commission, P.O. Box 121, Port-of-Spain, Trinidad, W. I.
Closing date for Tenders Monday July 31, 1961.

OFFICIAL PROPOSALS

Bids: July 6, 1961

Port of Oswego Authority Construction of East Side Terminal Facilities, Contract 2

ADVERTISEMENT FOR BIDS

Sealed proposals will be received by the Port of Oswego Authority in the Common Council Chambers, City Hall, Oswego, New York, until 2:00 p.m., Eastern Daylight Time, on the 6th day of July, 1961, and immediately thereafter will be opened publicly and read aloud.

The work to be done under this contract shall be completed in 540 calendar days after the date specified in the Notice to Proceed, and consists of a marginal wharf transit shed, railroad tracks and crane rails, grading and paving, dredging, and utilities.

Bid guaranty in the amount of $50,000 and a performance bond in the sum of 100 per cent of the contract price will be required.

Contract Plans, Specifications and Proposal Forms may be obtained from the Port of Oswego Authority, West First Street, Oswego, New York, and from the Engineer, Fay, Spofford & Thorndike 11 Beacon Street, Boston 8, Massachusetts, on or after the 7th day of June, 1961.

A deposit of $100.00 is required for a complete set of Contract Documents and Plans, which will be refunded upon return of the Plans and Specifications in good condition within 10 days after the opening of bids.

PORT OF OSWEGO AUTHORITY
By Clark Morrison III, Chairman

Bids: June 28, 1961

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, June 28, 1961

For Narrows Bridge Contract No. NB-6, Suspended Structure and Decks on Anchorages. Work includes the steelwork and concrete paving for a two level suspended structure at the entrance to New York Harbor.

Each bid must be accompanied by a deposit in the amount of $500,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $100.00, which will not be refunded.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5614) will be received at Fargo, North Dakota, until 10 a.m., Central Standard Time, July 11, 1961, for furnishing labor and materials for Morris Substation, Stage 01, Transmission Division, Minnesota, Missouri River Basin Project. Location near Alberta, Minnesota. Principal items are 23,000 cu. yds. excavation; lump sum—constructing service building; 750 cu. yds., concrete; 298,600 lbs., furnishing and erecting structural steel; 3 transformers, installing 20,000 kva power transformers; and other work. Completion time 425 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box 1993, Fargo, North Dakota; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for alterations for installation of mail-flo machinery at the U. S. Post Office (Main), Philadelphia, Pa., will be received until 2:00 P.M., June 23, 1961; and then publicly opened. Bidding material may be obtained from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., from the Custodian of the building where the work is to be done, or from the Chief, Philadelphia Field Office, Design & Construction Division, Room 902, U. S. Custom House & Appraisers Stores, 2nd & Chestnut Street, Philadelphia 6, Pa.

READ THE OFFICIAL
PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

Bids: June 22, 1961

The Port of New York Authority Elizabeth-Port Authority Piers

TERMINAL STREET—PHASE II
SAND DRAINS
CONTRACT EP-110.019

Sealed proposals for the construction of sand drains for the extension of Terminal Street in the vicinity of the head of the Elizabeth Channel at the Elizabeth-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Thursday, June 22, 1961, at which time said proposals will be opened and read in Room No. 1108.

Contract Documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, June 8, 1961

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• POSITIONS VACANT

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Steam Power Plant Design Engineer—Minimum 5 years responsible experience, including supervision of personnel, in design of steam power plants. Progressive consulting engineering firm offers permanent employment with opportunity for personal development and advancement potential. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Electrical Engineer—Experienced in design of electric transmission, distribution and substation facilities. Progressive consulting engineering firm offers permanent employment with opportunity for personal development and advancement potential. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Sanitary Engineer with extensive experience in preliminary engineering and design of sanitary projects. Submit complete resume of education, experience and qualifications, together with salary requirements. Stanley Engineering Company, Hershey Building, Muscatine, Iowa.

Draftsmen, Structural-Experienced, Checkers and detailers of structural steel shop dwgs. Relocation expenses. Fink & Zwecker Co., 1100 Crescent Ave., N. E., Atlanta 9, Ga.

Engineer with Gunite Experience for Midwest territory. Must be capable of estimating all types work. Send resume and references P-6760, Engineering News-Record.

Water Works Engineer—Graduate engineer 5-10 years experience design, construction, testing distribution systems. Permanent employment water works management company. Philadelphia, Pa. Reply P-6767, Engineering News-Record.

Electric Engineer—Large automobile manufacturing firm in Midwest has immediate opening. Requires B.S. in Electrical Engineering with industrial plant experience to follow automated machinery installation and plant engineering design including power distribution, lighting, etc. Age range 25-45. Send complete resume and approximate salary requirement to P-6800, Engineering News-Record.

Senior Estimator—Project Manager. Permanent position available with Houston based General Contractor. Civil or Architectural engineering degree preferred, with experience in estimating, including quantity survey and pricing, contract purchasing, shop drawing approval, expediting. Provide complete resume of experience, education and salary requirements. All replies confidential. P-6774, Engineering News-Record.

Chief Estimator—Leading West Coast contractor has an opening for a top man with 10 to 15 years heavy construction estimating and a minimum of 5 years field experience. Applicant must have been part of a construction company Management Staff, and a portion of his experience must have been in the Western States. Salary is open, with excellent opportunity for the right man. P-6795, Engineering News-Record.

Wanted—Graduate Civil Engineer experienced in sewer, water and concrete construction to work as foreman of construction crews for long established company in Northern Ohio area. Salary open. P-6806, Engineering News-Record.

Sanitary Engineer to handle technical liaison and correspondence and to prepare bids and proposals for the sale of waste treating and handling equipment and related items. Prefer MS and appropriate experience. Send complete details. Yeomans Brothers Company, 1999 North Ruby Street, Melrose Park, Ill.

Graduate Engineer—Estimator for Heavy Construction such as sewers, waterlines, bridges and dams. Permanent. Location Ohio. P-6819, Engineering News-Record.

CIVIL OR MECHANICAL ENGINEER
NEW YORK OFFICE

Nation wide multiplant grain merchandising company offers permanent position to civil or mechanical engineer, preferably with Masters degree.

Applicants must have several years experience in structural design. Experience in design and construction of grain elevator or of installations of similar type will be helpful. Knowledge of material handling equipment such as conveyors, bucket elevators, etc. desired.

A few trips per year to interior locations from New York City base.

Please send resume complete with all personal details including salary requirements, to

P-6777, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

DESIGNERS — SURVEYORS

Highway and Bridge Designers. Minimum 8 years exp. Registered Land Surveyors for Illinois. Usual benefits—permanent.

MACCABEE, CAMPBELL & Assocs.
173 W. Madison St. Chicago 2, Ill.

• POSITIONS VACANT

Detailers—Struct. steel—experienced only. David Zarin & Assoc., Harborside Term. Bldg., 34 Exchange Pl., Jersey City, N. J., HE 4-4411.

Desire Project Engineer—Superintendent. Must be thoroughly experienced in construction of water filtration plants. Must have had experience with batching plants & pumpcrete machines. Must know form work thoroughly and be able to organize all trades. Must also be thoroughly familiar with corp. of engineers work. This is a position with a large general contractor with rapidly expanding business. Only top men in this field will be considered. Salary commensurate with ability. P-6831, Engineering News-Record.

Graduate Civil Engineers with min. 2 yrs. highway and/or drainage experience. Positions open in Conn. consulting firm. Send complete resume including references, salary requirements and availability to P-6811, Engineering News-Record.

Experienced take-off man wanted by N. Y. General Contractor. Some purchasing and pricing experience required. Position available July 1st. Reply to P-6815, Engineering News-Record.

Construction Engineer—Young, willing to travel within U. S. Supt. & Supervisory capacity after training. Send resume and salary requirements. P-6830, Engineering News-Record.

Sanitary Project Manager for design of water treatment plants and distribution systems at overseas office. P.E. and minimum 10 yrs. experience required. P-6835, Engineering News-Record.

Soils and foundation engineer—recent graduate—Masters Degree, design and construction experience desirable. Salary open. Location Southwest. Write P-6838, Engineering News-Record.

Draftswomen for house surveys, some typing. Must be bright and with pleasant personality. Salary $300 to $550. Robinson Surveying Co., 110 W. 13th Ave., Denver 4, Colo.

• EMPLOYMENT SERVICES

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 50 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 659 Brisbane Bldg., Buffalo, N. Y.

(Continued on the following page)

CIVIL ENGINEER

European manufacturer undertaking responsibility for the design of a heavy industrial plant to be located in the United States desires to employ American graduate Civil Engineer familiar with American standards.

Candidate should meet the following requirements:

—10 to 15 years experience in heavy or plant construction

—5 years specific experience in specification writing and bid preparation. Must be capable to head personally all contracting activities related to the project: specification writing, bid preparation, contract negotiation, etc.

—Administrative ability

—Some knowledge of the German language

—Willingness to move to Zurich, Switzerland for one or two years.

This engagement offers a permanent position with wide opportunity for personal development and advancement in a worldwide industrial organization with manufacturing subsidiaries in many countries including the United States. Moving expenses to Switzerland for initial assignment to be paid. Salary open.

Please submit full particulars on qualifications as preliminary to personal interview. This advertisement is a direct inquiry by employer.

P-6812, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

CIVIL ENGINEERS:

Expanding construction company in Connecticut has immediate openings for:

Field Superintendent for Commercial & Industrial Buildings

Field Superintendent for Land & Housing Development

Project Engineer for Design & Job Coordination

Send complete resume and minimum salary requirement to

P-6778, Engineering News-Record
Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

PROJECT MANAGER

To assume management and supervision of large, heavy construction project. Must be graduate engineer and capable of supervising engineering, purchasing, steel erection, concrete work, etc., and have exhibited ability and drive on other multi-million-dollar construction projects. Unless you are a graduate engineer and have had at least ten years' experience in heavy construction at management level, do not bother to answer this advertisement.

P-6809, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

REPRESENTATIVES or DISTRIBUTORS for STRUCTURAL STEEL PRODUCTS

Fabricator of unique line of stock-designed structural steel products seeks aggressive representative immediately for Central and Atlantic areas, excluding Pa., Del., N. J. and New England. Will also consider representatives for other sections of country. To contact architects, structural engineers, contractors, builders, etc. Should have own qualified estimators, detailers, draftsmen, and erectors available. Product advertisements draw tremendous response from all over the world, and initial leads will be furnished.

Write **RW-6684,** Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• EMPLOYMENT SERVICES

(Continued from preceding page)

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• POSITIONS WANTED

General Contractors' Superintendent—age 43 —experienced power plants, sewerage plants, industrial. Prefer Illinois-Indiana location. Will relocate to suit. A-1 references. Reply to PW-6706, Engineering News-Record.

Construction Manager: 13 years chemical, textile & industrial experience. BS and MS Civil Engineering. Professional Engineer NY & Delaware. Will relocate in N. E. US. PW-6707, Engineering News-Record.

Superintendent—Experienced in excess of forty completed contracts for highway and heavy earth moving, bridges. Complete project planning and execution. Will relocate. Reply PW-6727, Engineering News-Record.

Structural Engineer, Graduate C.E., 36, 10 years design exp. in conc. and steel for industrial structures. Desire position Westcoast, West. PW-6729, Engineering News-Record.

Former Consultant—strong in materials handling and plant layout field. Supervised erection of large facilities, including plant and machinery. Personable, sales-minded. 35 yrs. of age, seeks position with growth in New York or Northern New Jersey area. PW-6773, Engineering News-Record.

Project Manager, entire supervision, contract negotiations, estimating, claims, 22 yrs. hvy. constr. major projects U.S. & O.S. PW-6804, Engineering News-Record.

Reg. Civil Engr., BSCE, 36, 12 yrs. exp. in studies, design & superv'n of hwy, airp't & other hvy constr. Desires challenging opportunity in civil or related field in NE. PW-6798, Engineering News-Record.

B.S. Arch. Engr., P.E., 34, 11 years comprehensive experience in all phases industrial and commercial construction, architectural and structural design. Desires responsible position with potential. PW-6738, Engineering News-Record.

General Superintendent — Proj Mgr. Hvy Const. roads, bldgs, flood control, tunnels, excellent mech. background. P.O. Box 48, St. Louis 5, Mo.

Electrical Construction Engineer, age 36, B.S.E.E. '50, (Power), P.E., 7½ years industrial and military construction experience, 6 years overseas, immediately available, desires foreign employment. PW-6828, Engineering News-Record.

Construction Superintendent past retirement but still active desires job as inspector for architect or owner or subordinate job with contractor. PW-6824, Engineering News-Record.

Civil—Sanitary—Presently in charge 54 MGD sewage treatment plant. Varied experience design and city engineering. BS Oregon State MS Georgia Tech. Reg. PE. age 35, Geo. M. Jacobs, 2928 Westmoreland Dr., Nashville, Tenn.

Master Mechanic or Heavyduty Mech. & Welder. Prefer good paying dirt spreads. 20 yrs. experience all kinds of equipment. Tom Findley, 304 E. Cross St., DeWitt, Arkansas. Ph WH 6-4404.

Civil Eng., age 29, 6 yrs. exp. road & site work, desires position with General Cont., Northeast U. S. PW-6816, Engineering News-Record.

Owner's and Architect's Representative, Civil Engineer, Plant Superintendent, experienced Construction Supervisor, Reg. N. Y. State, N.S.P.E., A.S.C.E., BS in CE, M.B.A., 49. Twenty-eight years experience, office buildings, hospitals, chemical plants. Desires responsible position with top firm engaged in major expansion. PW-6825, Engineering News-Record.

Plumbing, Heating, Air. Cond. & industrial piping Designer, 57, experienced all types buildings. Will relocate. PW-6829, Engineering News-Record.

Warehouse Superintendent — Overseas. 3 contracts, oil and airbases. Also exp. U. S. Govt. Auditor reimbursemenet contracts. Now employed N. Y. City. PW-6832, Engineering News-Record.

BSCE, Comm. Pilot's License, 33, 10 years varied experience in design and construction. Resume on request. PW-6836, Engineering News-Record.

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• BUSINESS OPPORTUNITY

Municipal Consulting Engineer interested in partnership or as associate with established firm in Southwest. BO-6839, Engineering News-Record.

CONTRACTOR'S used equipment, priced to sell; very good to excellent condition; 120 yd. Johnson semi-automatic concrete batching plant; 3,500 sq. ft. Economy steel forms for concrete walls; 35,000 sq. ft. used Irvington standard all steel unit forms for concrete form work, excellent condition; Littleford Kwik Steam generator; 2 Chester 5 ft. diameter dual tandem sheepsfoot rollers; Rome disc plowing harrow, model TMR 24-30; 10 ton, 3 wheel Huber roller; 2 6-inch Moretrench wellpoint pumps with 600 ft. pipe main system and all accessories; Northwest crawler crane, SN 12527; P & H crawler crane, model 855-A LC diesel, SN 10562; 1946 P & H crawler shovel, model 855-B, SN 10984; (P & H cranes have shovel front and backhoe attachments); 3 TD-24 bulldozers, SN 1914, 2024, 4266; contractor's field office trailer; crane buckets: ¾ yd. to 2½ yd. (drag, clam and orange peel, etc.); 2—1¼ yd., Multi-Foote Pavers; Galion Motor grader; Adams motor grader; Cement bulk tank trailer; bulk cement car unloader. **Write P. O. Box 402, Barre, Vermont. Phone Granite 6-4103.**

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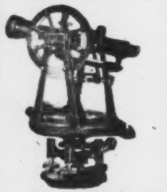

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Editorials

To Improve Federal Pay

Every so many years—as inflation and the law of supply and demand continue to raise salaries of engineers in private employ—public agencies, including the federal government, must adjust their pay ranges upward.

A bill now before the House Committee on Post Office and Civil Service would do more than adjust federal salaries for engineers. It would create a new Professional Engineering-Scientific civil service classification in an attempt to improve both salaries and salary administration.

This bill (H.R. 5563) states worthy purposes. The system of classification and compensation it proposes is intended to improve the government's chances of getting the good people it needs and then to help the government reward and keep such people. The Professional Engineering-Scientific classification in the bill offers grades PES-1 to PES-10 comparable to present GS-5 to -18 grades under the existing law. (Federal Civil Service classification used to include a P schedule for professional engineers, but the present General Schedule—GS—came in with the Classification Act of 1949.) Yearly pay in the new schedule would range $6,400 to $7,600 for PES-1; $8,000 to $9,200 for PES-2; and so on up to a $20,000 top pay for the PES-10.

Two years after the bill became law it would require that only graduates of accredited engineering schools or licensed engineers or certified engineers-in-training qualify for engineering jobs in the PES classifications.

The National Society of Professional Engineers backs H.R. 5563. The American Society of Civil Engineers endorsed the bill at its recent Phoenix meeting. Engineers in federal employ generally favor its special professional grades. Considering its purpose of improving the government's chances of hiring and keeping high quality personnel, the bill deserves wide support—especially from the construction industry in which engineers in federal employ play so big a part.

Taxing, More Ways Than One

The fellow who commutes from New Jersey to New York—his patience taxed by traffic jams and train troubles—now will have his income taxed by New Jersey instead of New York in an effort to ease his state's commuting problems. He will, that is, if a tax law just passed in New Jersey can stand the court test it seems sure to get.

The commuters' income tax New Jersey proposes has an admirable objective. It would help finance a more efficient transportation system for the traffic-wracked North-Jersey metropolitan area, with its 220,000 commuters to and from New York each day. Some 150,000 New Jersey residents work in New York; about 70,000 New Yorkers work in New Jersey. Keeping the Jerseyites' income tax in New Jersey is expected to make $40 million to $50 million yearly available there for rail rapid transit, bus, highway and bridge improvements in the metropolitan area west of the Hudson River.

But the tax brings complications. New York's Gov. Nelson Rockefeller hardly sees eye-to-eye with New Jersey's Gov. Robert Meyner, whose idea it was. Since New York State already taxes all income earned within its bounds, the new law depends upon New York to stop taxing Jersey's commuter-citizens. Actually, it demands that taxes now collected by New York go to Trenton instead of Albany. New Jersey, in return, would tax New Yorkers working within its bounds and turn over the take to Albany. This sounds equitable, but it's complicated. Since New Jersey's gain from it all will be New York's loss, a bi-state squabble is already started. And within New Jersey there will remain the serious doubt as to the fairness of taxing only bi-state commuters for improvement that others there will enjoy. Those who live and work in New Jersey will continue to enjoy freedom from any state income tax.

Whatever comes of New Jersey's commuter tax it is serving to point up to the nation just how complex the commuter problem can become. The tax-swapping arrangement dramatically displays the difficulties of equitably financing transportation improvements for bi-state metropolitan areas, whose growing traffic problems are aggravated by political division.

There are 21 such bi-state areas in these United States, in addition to this area astraddle the Hudson. All would do well to keep user charges, fares and tolls, adequate to the financial needs of their mass transport growth, lest they, too, become embroiled in such a situation as faces New Jersey and New York.

A Better 'ole

The cluttered obstacle course for excavating equipment formed by inclined braces shoring the sides of excavations presents a sad sight in this age of technological marvels. Now, thanks to the Pretest Tieback system developed by Spencer, White & Prentis, New York City foundation contractor, this unlovely spectacle of inefficiency may eventually disappear from sites with adequate rock substratum. With its disappearance builders will get much more production out of their equipment, without the irritations and hazards associated with internal (infernal) bracing.

The tieback system makes very efficient use of prestressing, as described in the article on p. 34. But Spencer, White & Prentis have produced more than a mere technological breakthrough; they have made an aesthetic advance in the art of construction. Not alone the constructors, but sidewalk superintendents, with their improved view of excavation operations made possible by open building sites, should be eternally grateful.

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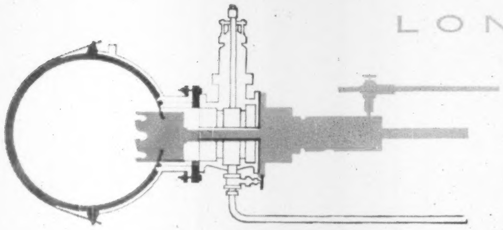

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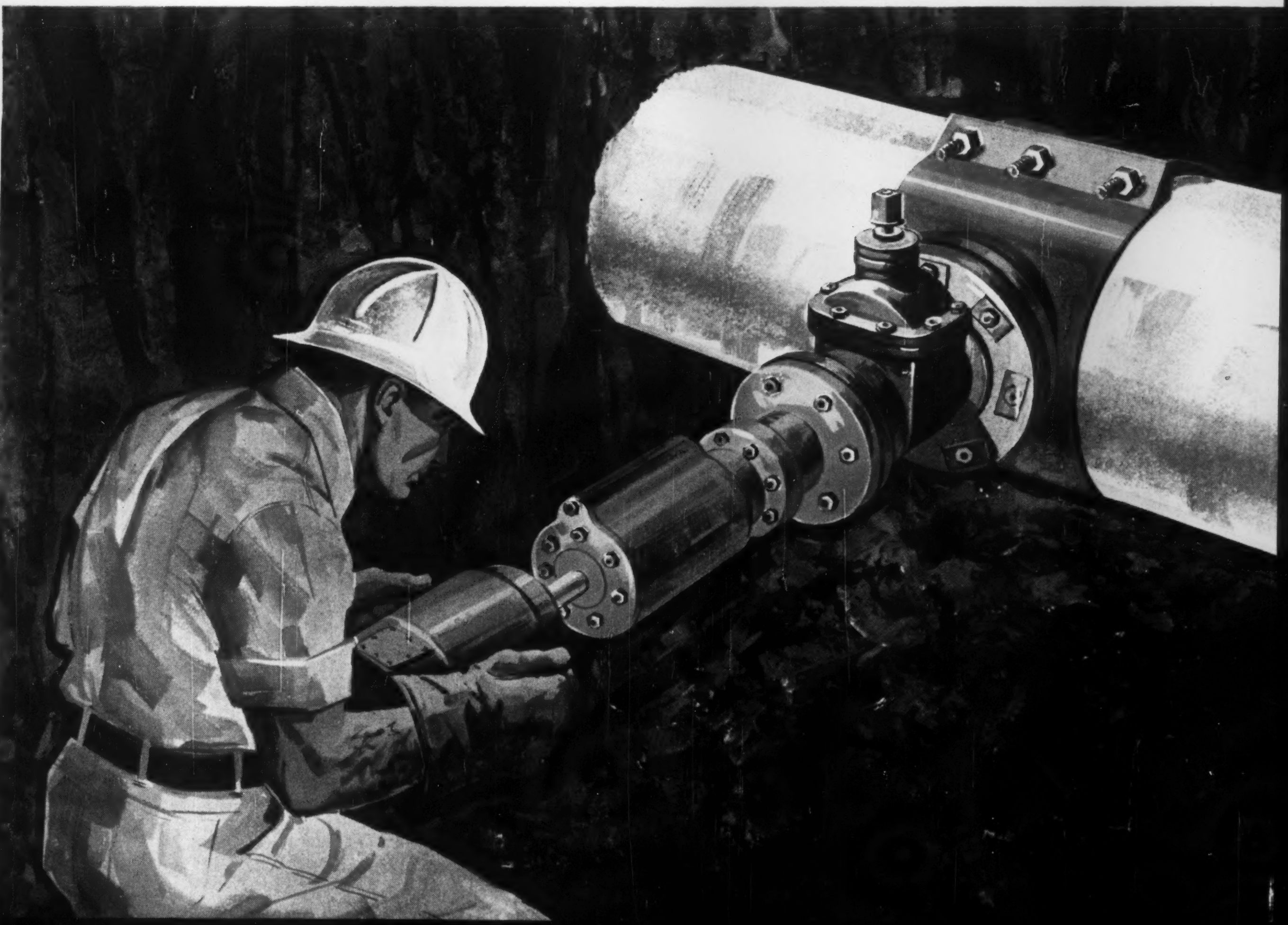

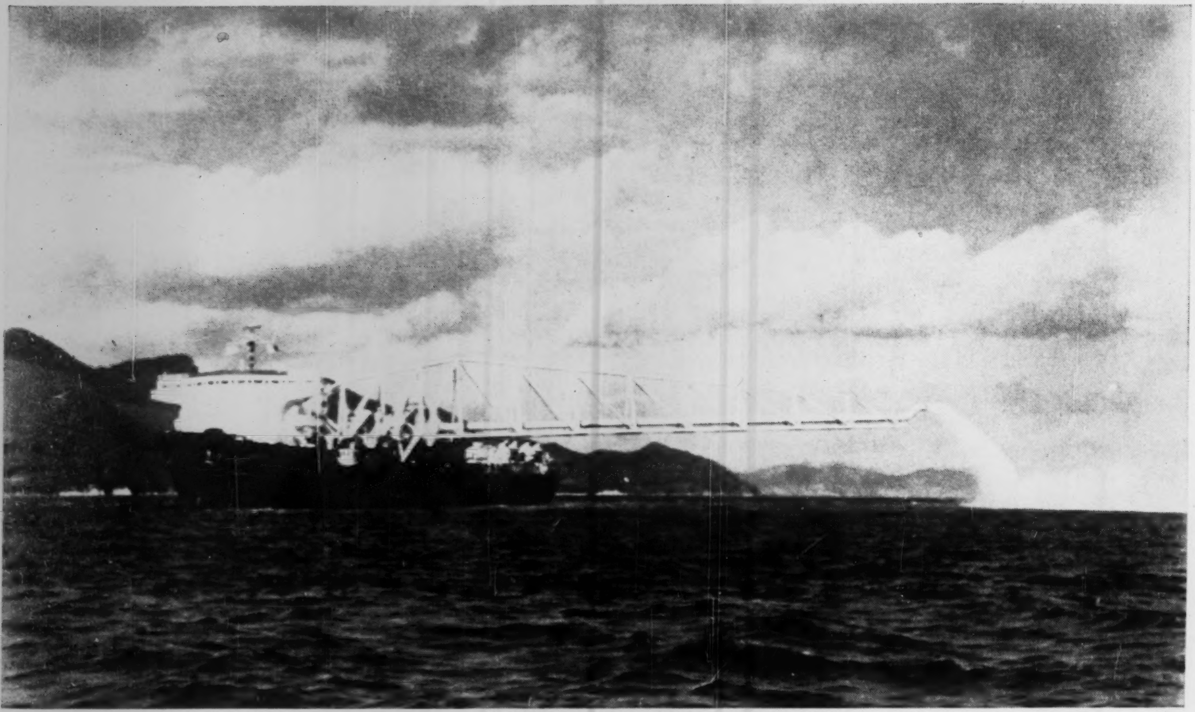

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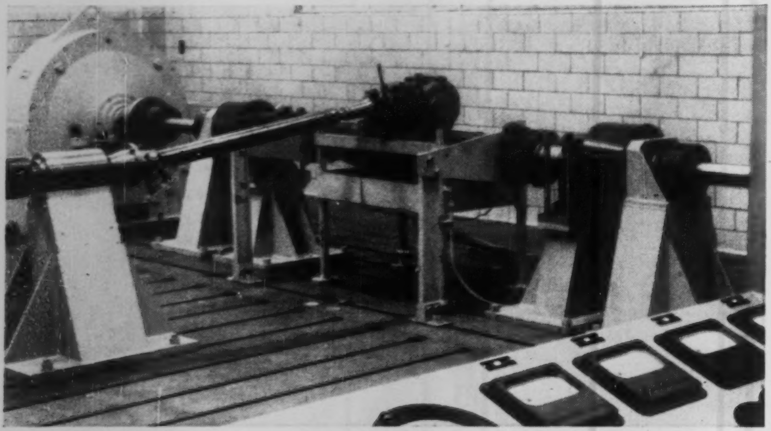

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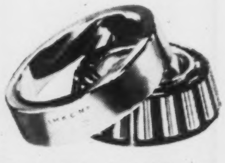

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